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May 1982
Final Report

DOT HS 806 294

U.S. Department of Transportation
National Highway Traffic Safety Administration

SYSTEMS ANALYSIS APPROACH TO RESTRAINT SYSTEMS INTEGRATION - SLED TEST SUPPORT

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Contract No. DTNH22 82 C 07132
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Technical Report Documentation Page

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16. Abstract

This report covers the final phase of a three phase program whose overall objective was to demonstrate the validity of the systems analysis approach to restraint systems development.

The term "systems analysis approach" is used to convey the concept of using high speed computing techniques to design and integrate airbag restraint systems into the subject vehicle in a way that is optimally compatible with its crash environment. If successful, the necessity of conducting a large number of preliminary tests prior to converging to the final design will be minimized since the many interrelated parameters that affect restraint system performance can be investigated in a highly efficient manner through computer simulation.

17. Key Words Airbag, Restraint system, Forward positioned occupant, Bagslap, PAC and DRACR computer model, DeLorean sports car.	18. Distribution Statement Document is available to the U. S. public through the National Technical Information Service, Springfield, VA 22161

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APPENDIX A

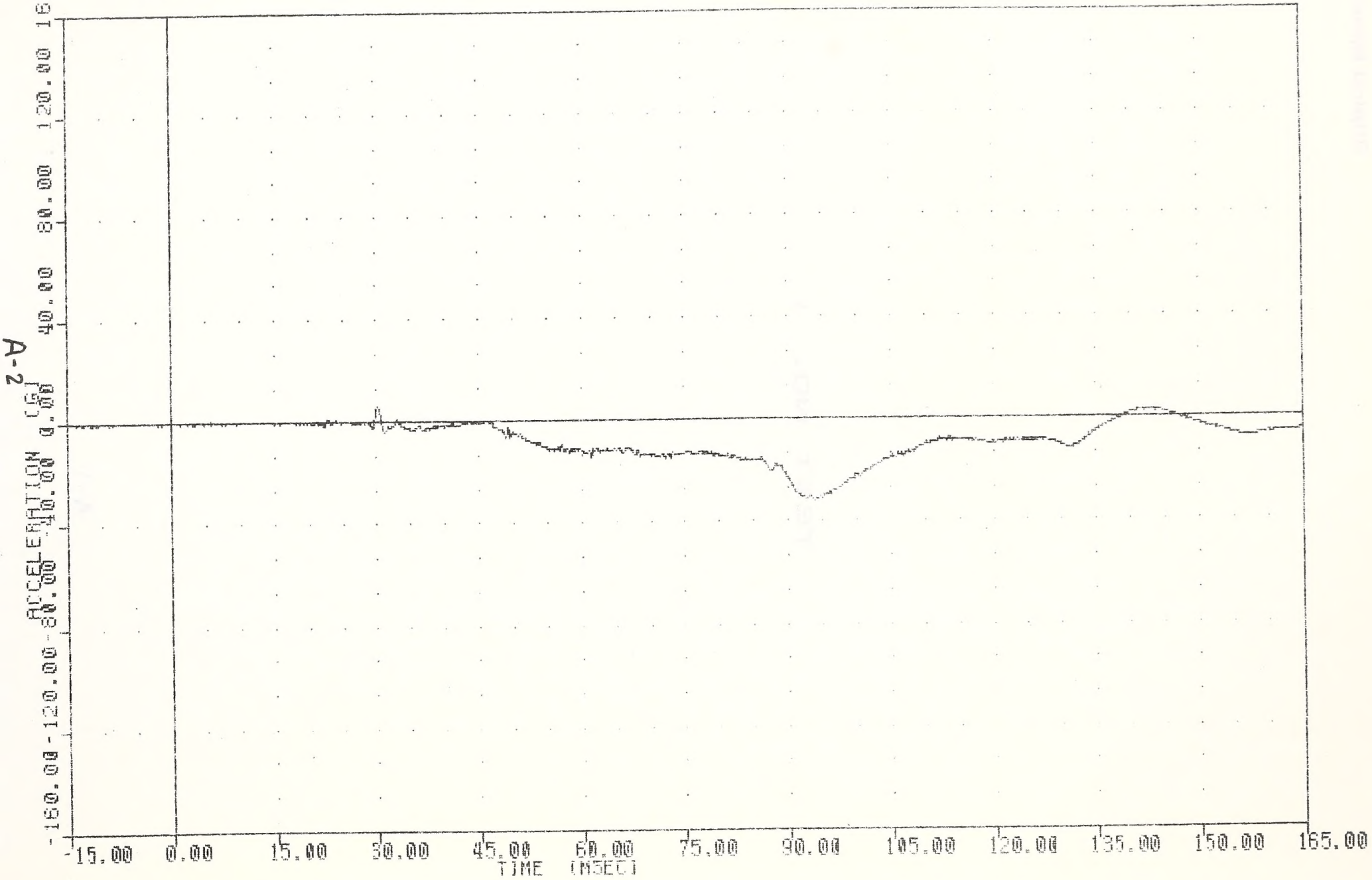
SLED TEST DATA

TEST NO. 1

S510150003
REST. MODEL VALID. TEST
820621326
HEDXG1

16-MAR-82 08:29:35

FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -31.85 @ 93.75 . 6.11 @ 30.00



HEAD ACCELERATION X AXIS DRIVER

A-2

S51015003 16-MAR-82 08:29:35
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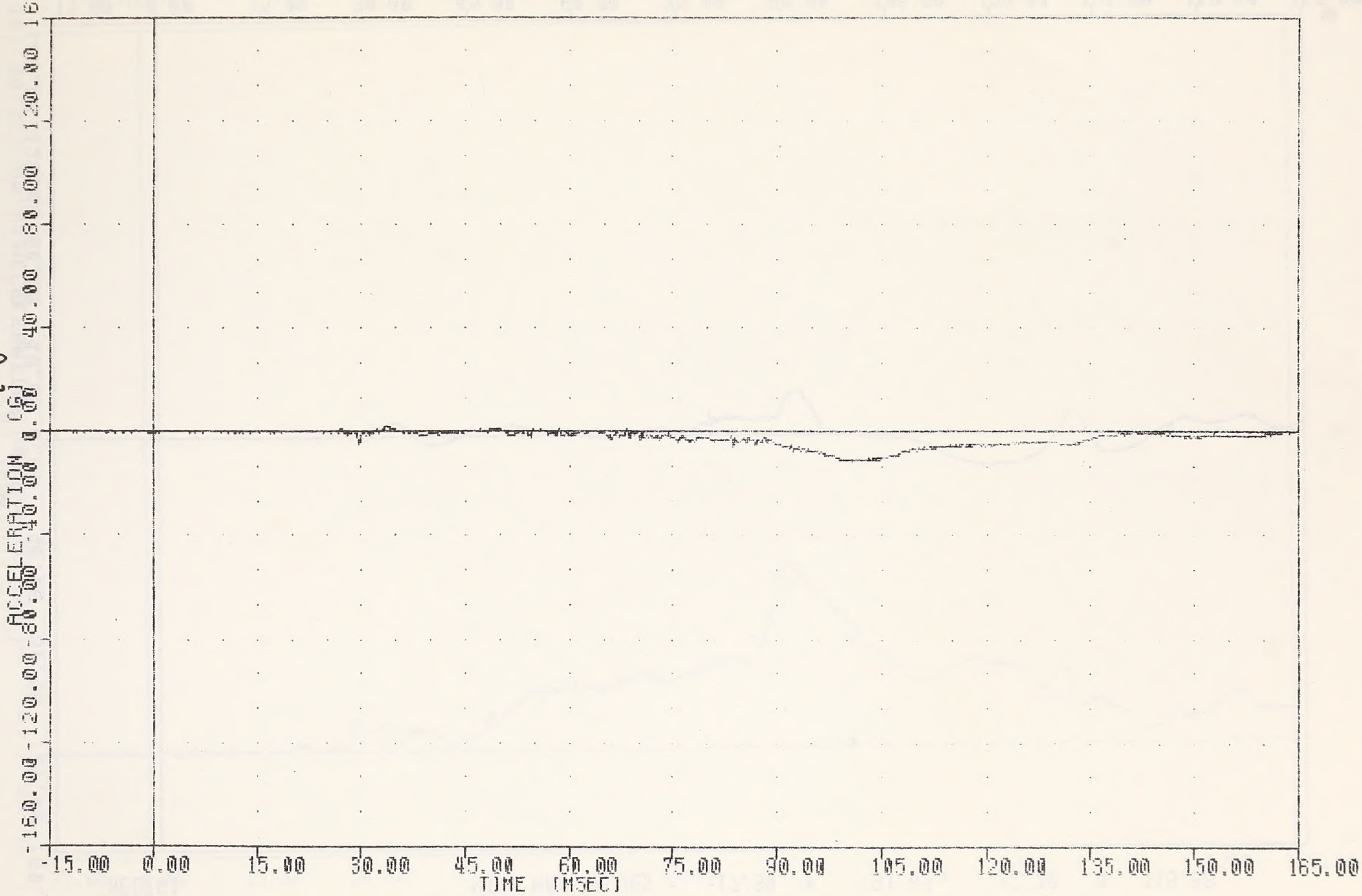
HEDYG1 MIN. MAX VALUES = -11.28 @ 100.63 , 1.97 @ 33.50



HEAD ACCELERATION Y AXIS DRIVER

A-3

S51015003 16-MAR-82 08:29:35
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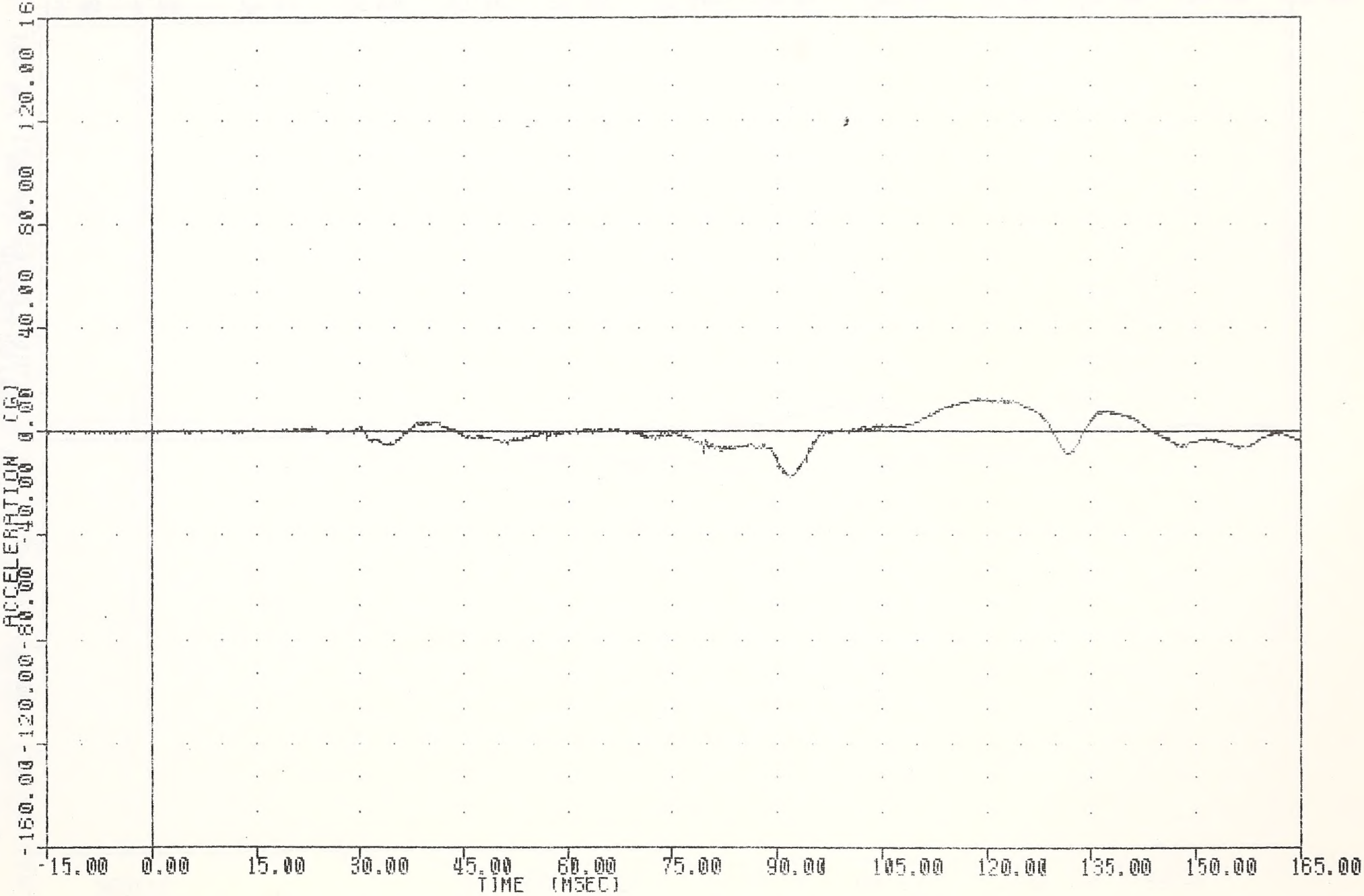
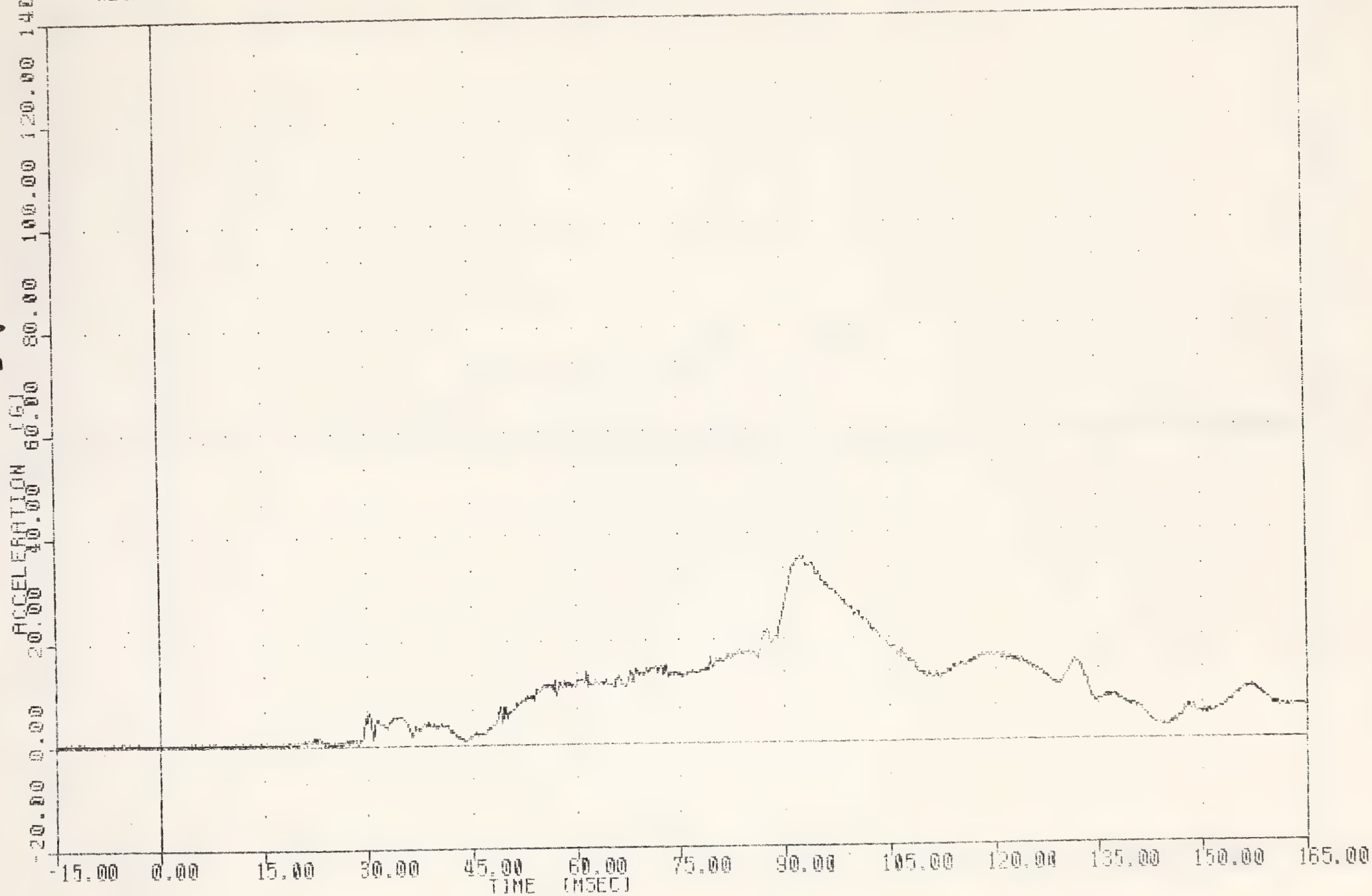


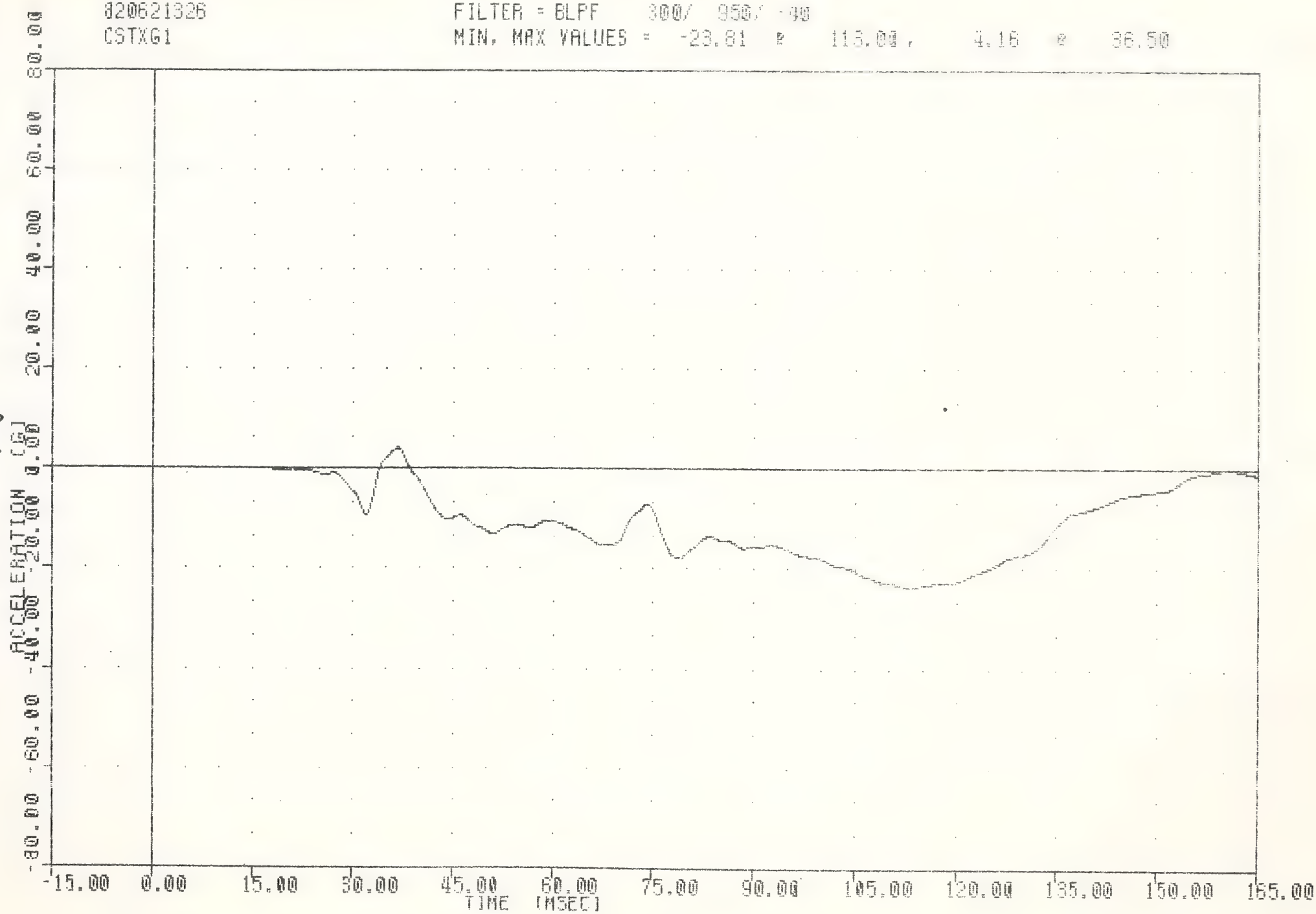
HEAD ACCELERATION Z AXIS DRIVER

S51015003 16-MAR-82 08:29:35
REST. MODEL VALID. TEST
820621326
HEDRG1

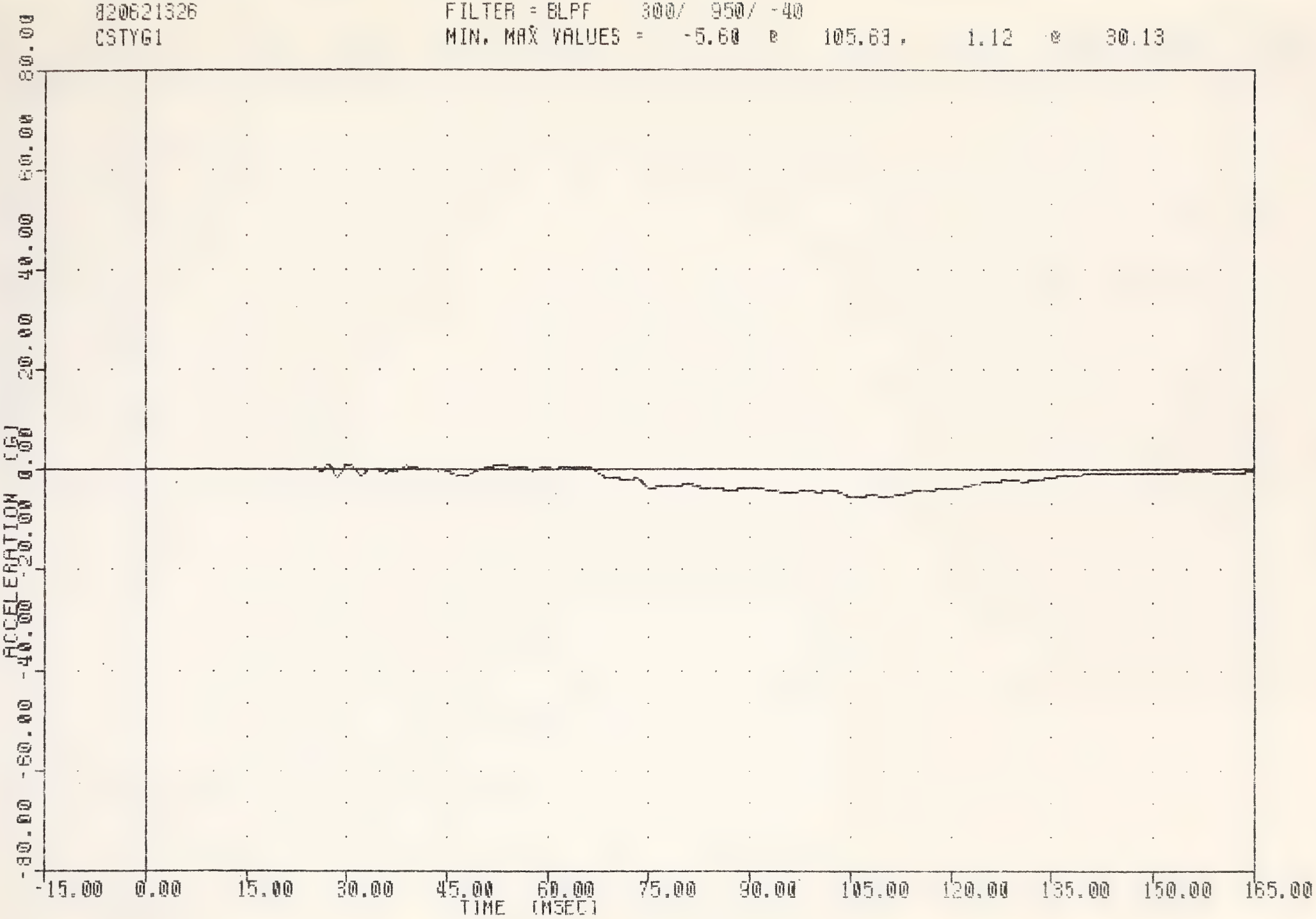
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.05 @ 1.75 , 85.46 @ 92.25



HEAD ACCELERATION RESULTANT DRIVER



CHEST ACCELERATION X AXIS DRIVER



CHEST ACCELERATION Y AXIS DRIVER

S51015003 15-MAR-82 16:02:31
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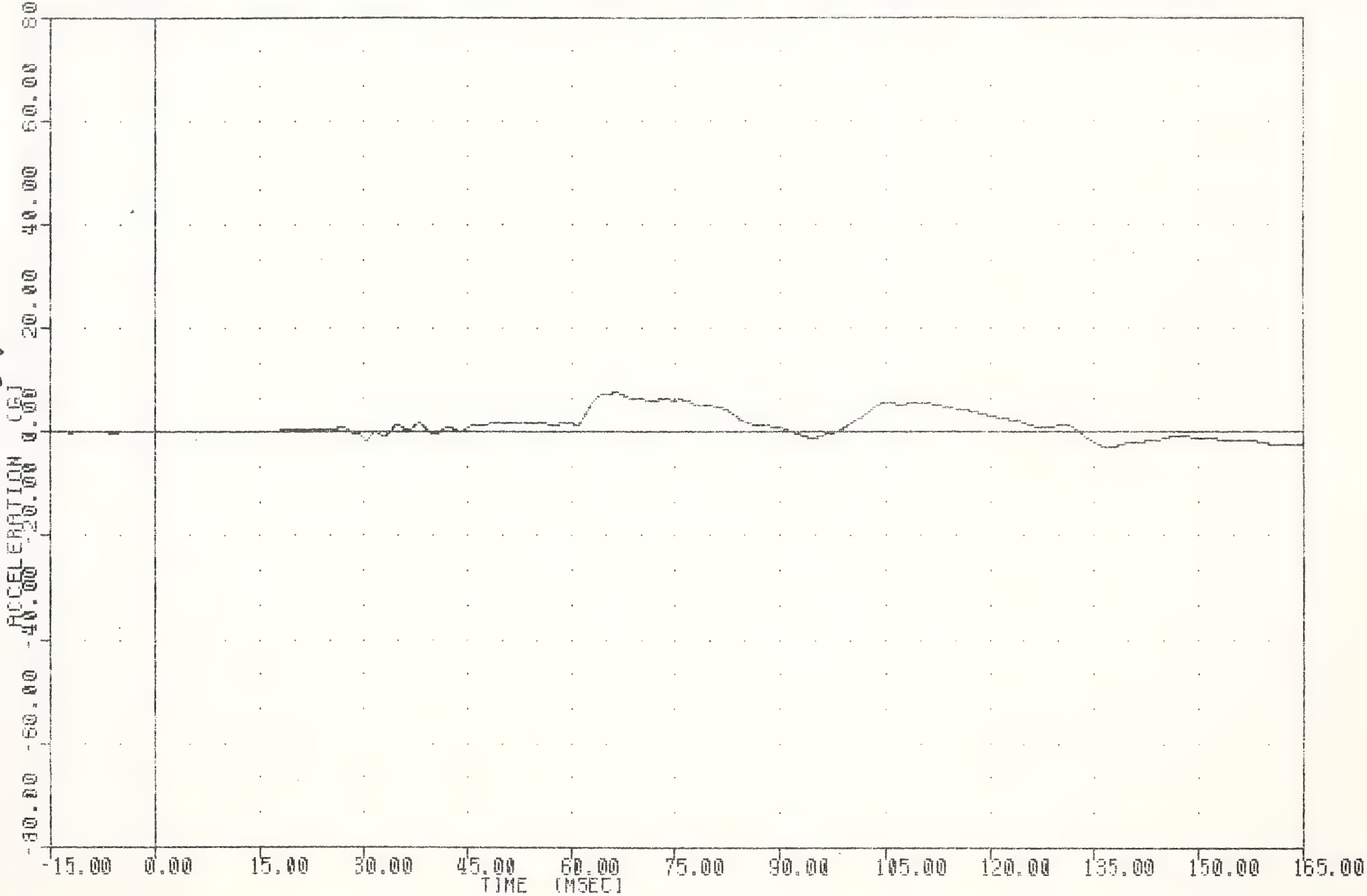
CSTZG1 MIN, MAX VALUES = -2.97 @ 137.00 , 7.66 @ 66.25



CHEST ACCELERATION Z AXIS DRIVER

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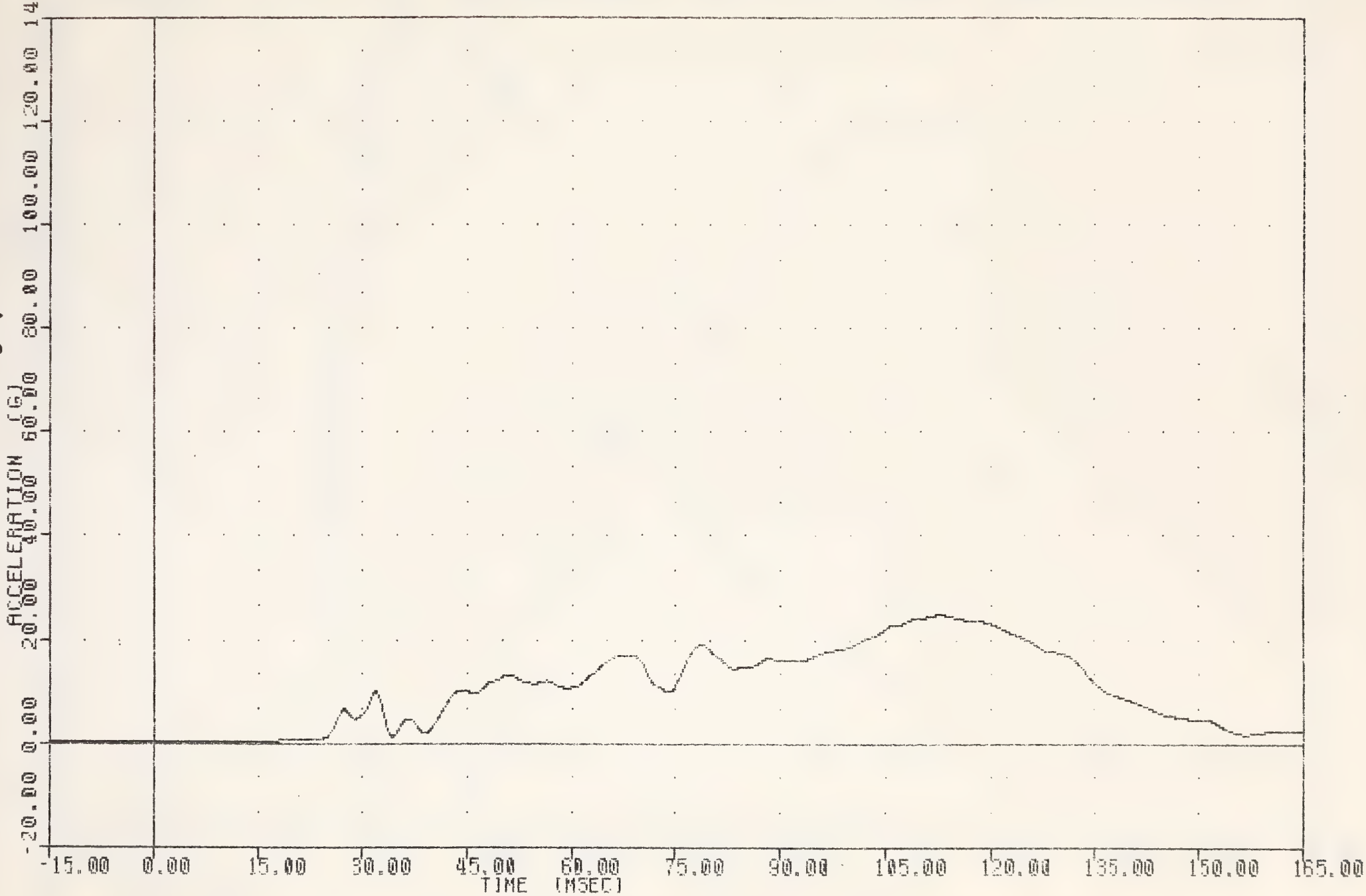

CHEST ACCELERATION RESULTANT DRIVER

S51015003
REST. MODEL VALID. TEST
820621328
LFMF1

16-MAR-82 08:29:35

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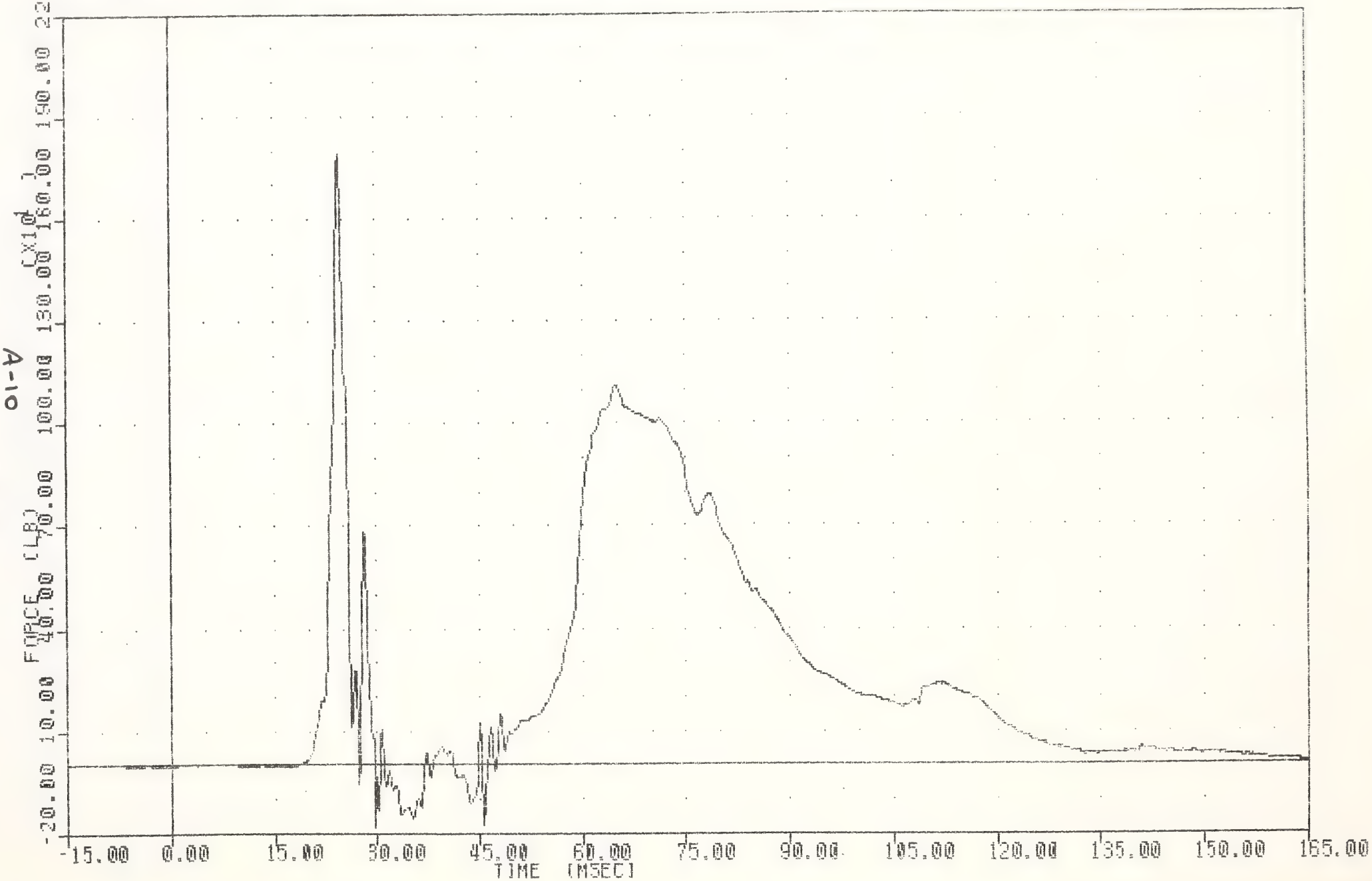
MIN, MAX VALUES = -363.45 @ 29.88 , 1792.05 @ 24.88



LEFT FEMUR FORCE DRIVER

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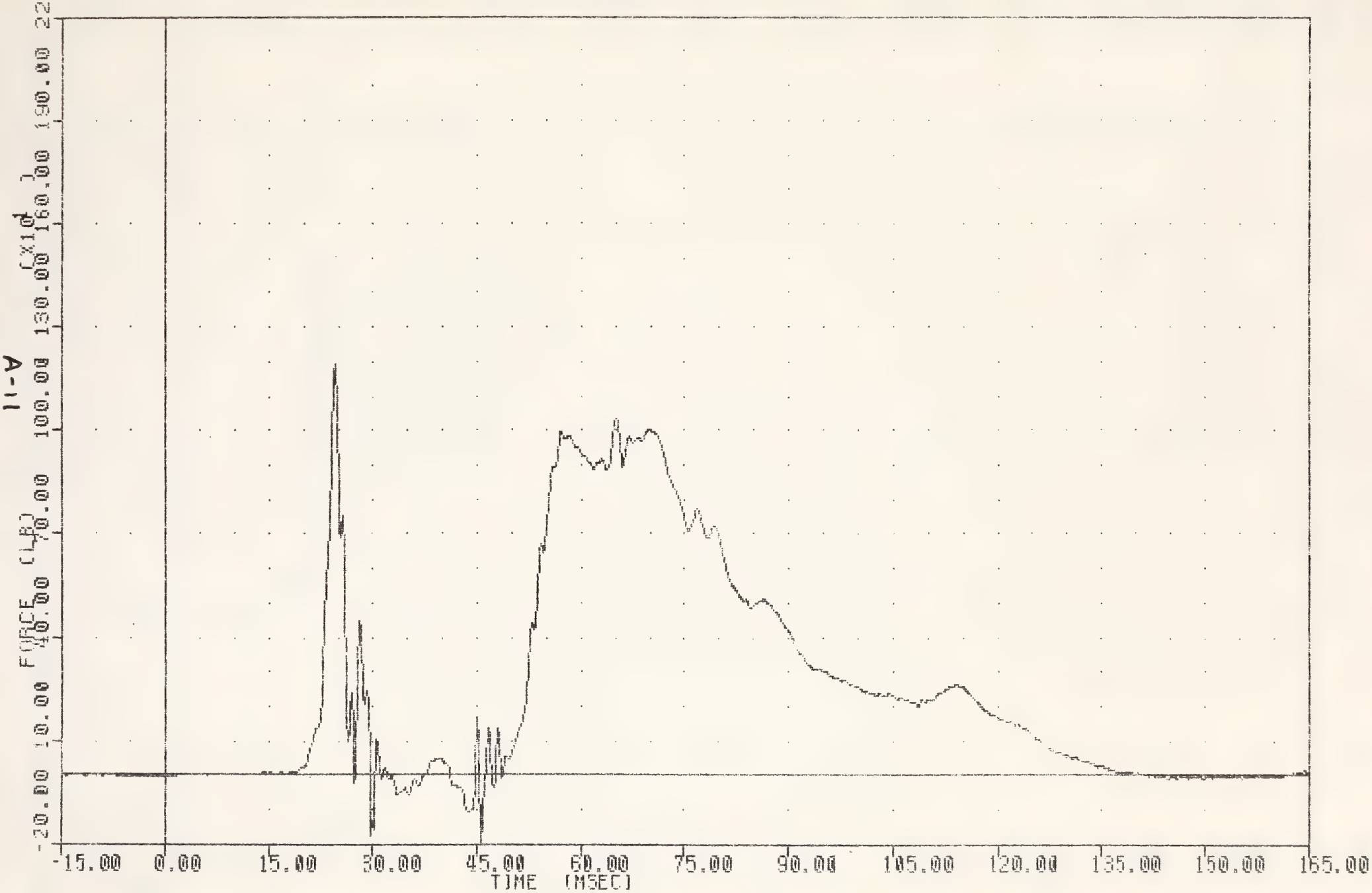
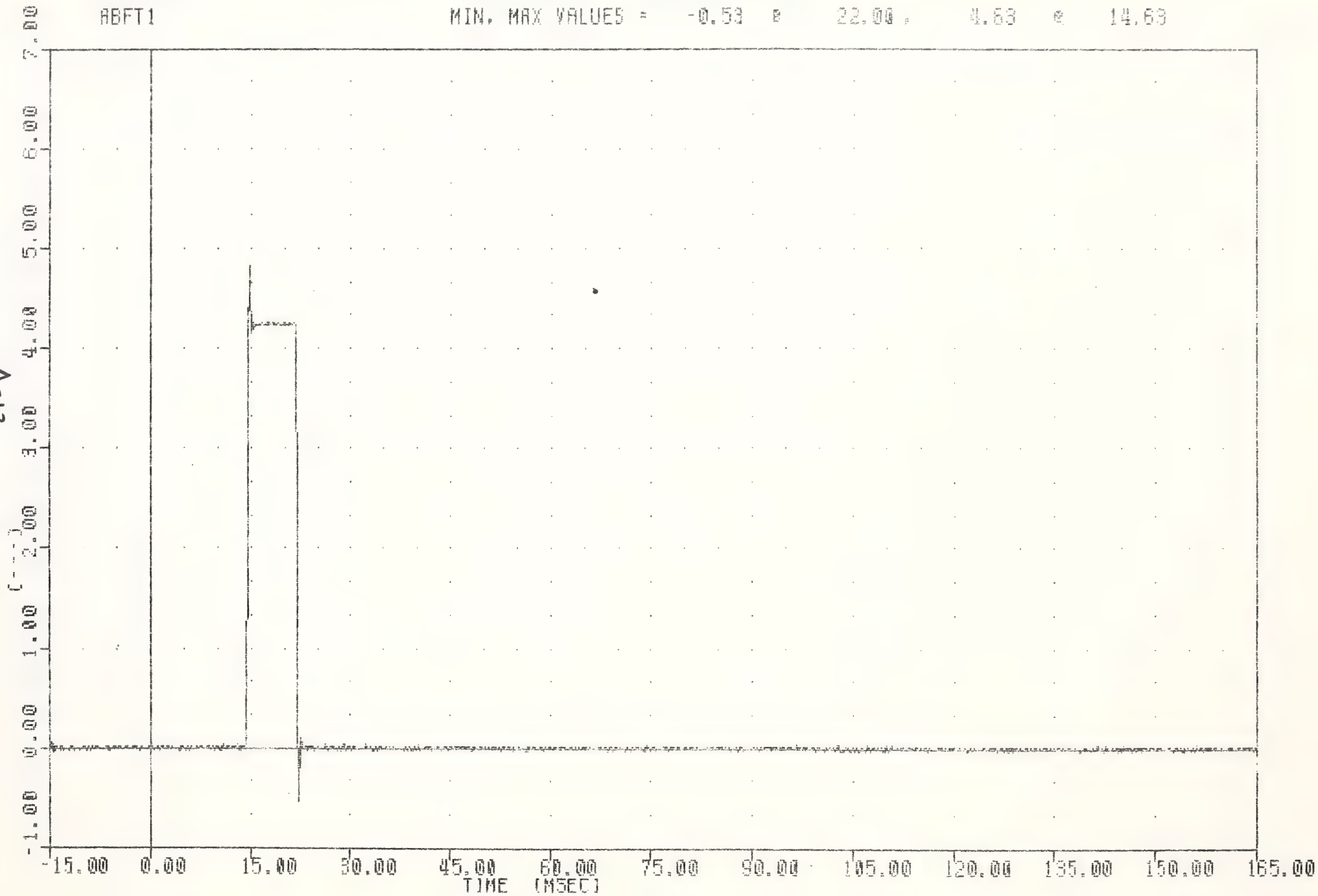
RFMF1 MIN, MAX VALUES = -265.93 @ 29.75 , 1195.62 @ 24.38

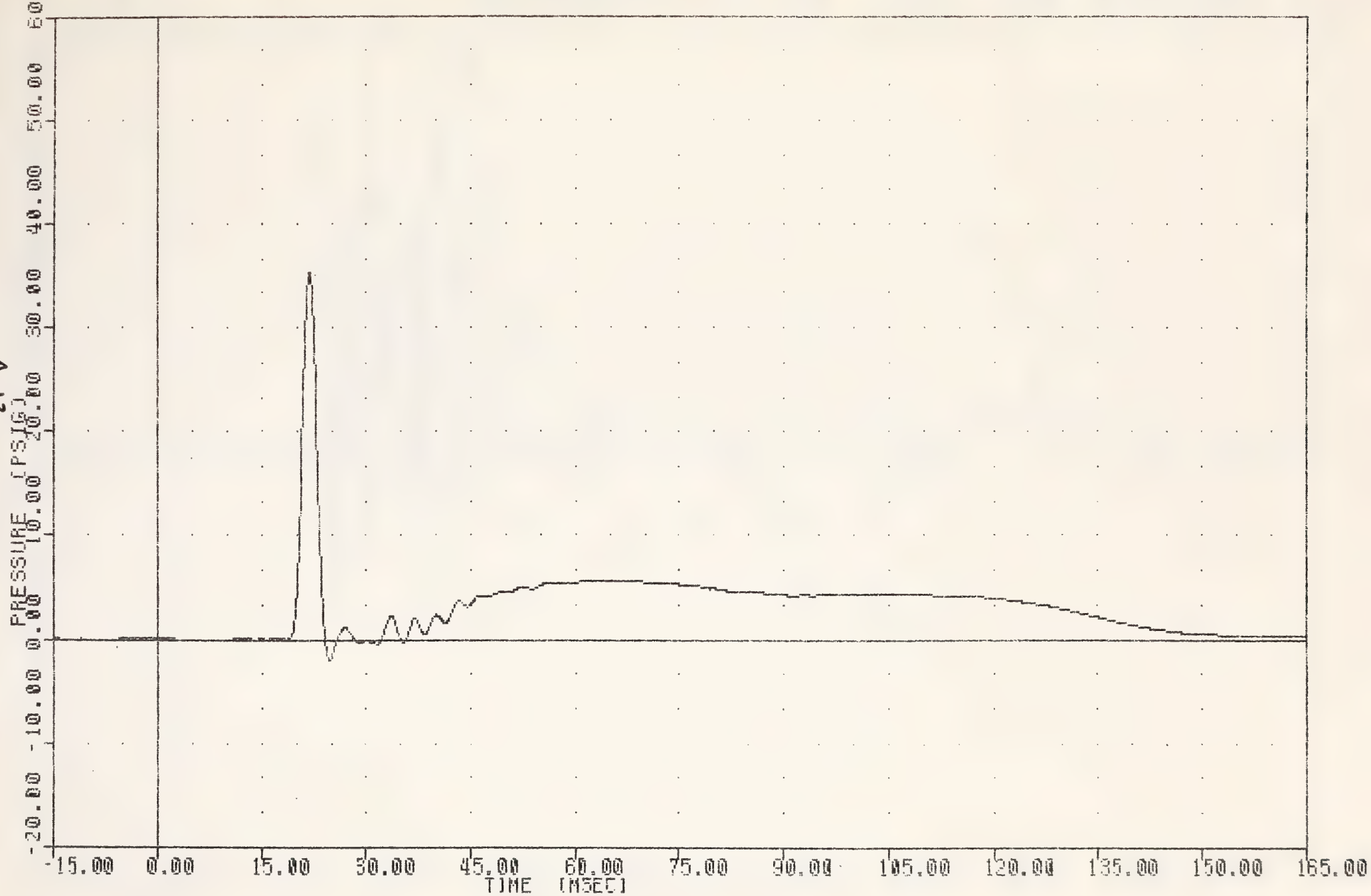


RIGHT FEMUR FORCE DRIVER



AIR BAG FIRING EVENT DRIVER

S51015003 16-MAR-82 08:29:35
REST. MODEL VALID.- TEST-
820621326 FILTER = BLPF 300/ 950/ -40
ABP1 MIN, MAX VALUES = -2.07 @ 24.63 , 35.25 @ 21.75



AIR BAG PRESSURE DRIVER

S51015003 16-MAR-82 08:29:35
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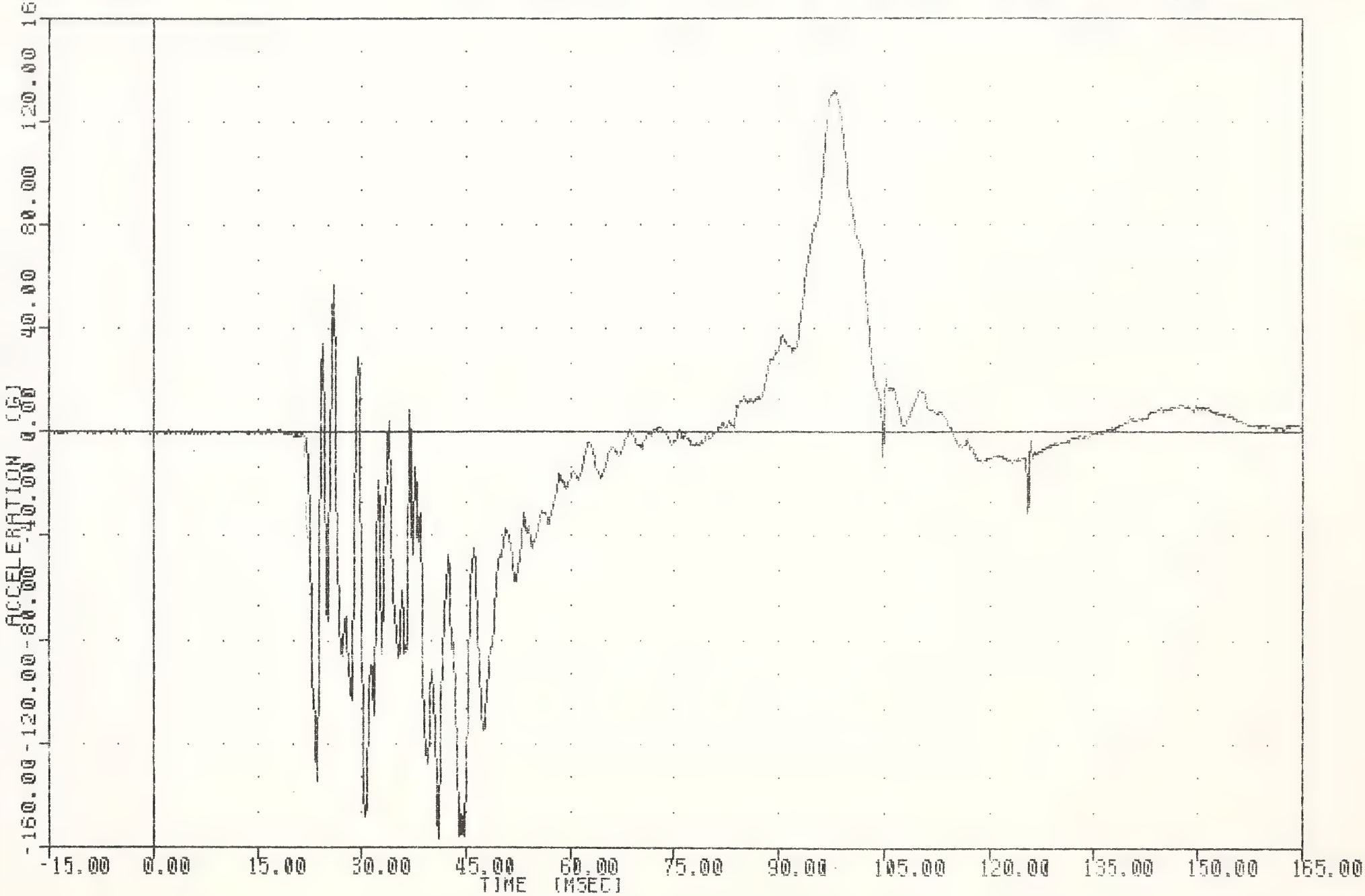
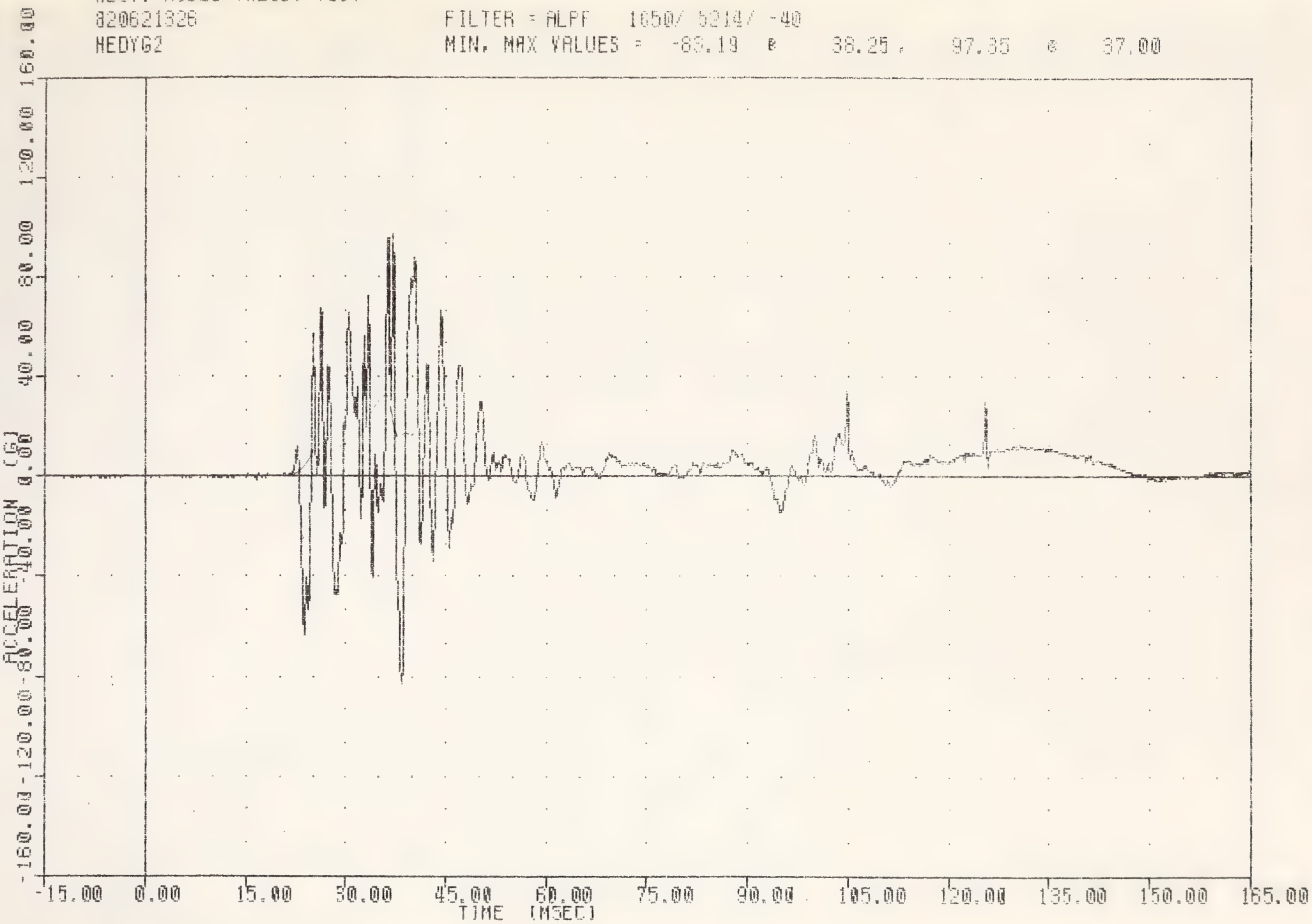
HEDXG2 MIN, MAX VALUES = -172.36 @ 44.13 , 131.48 @ 37.75



HEAD ACCELERATION X AXIS PASSENGER

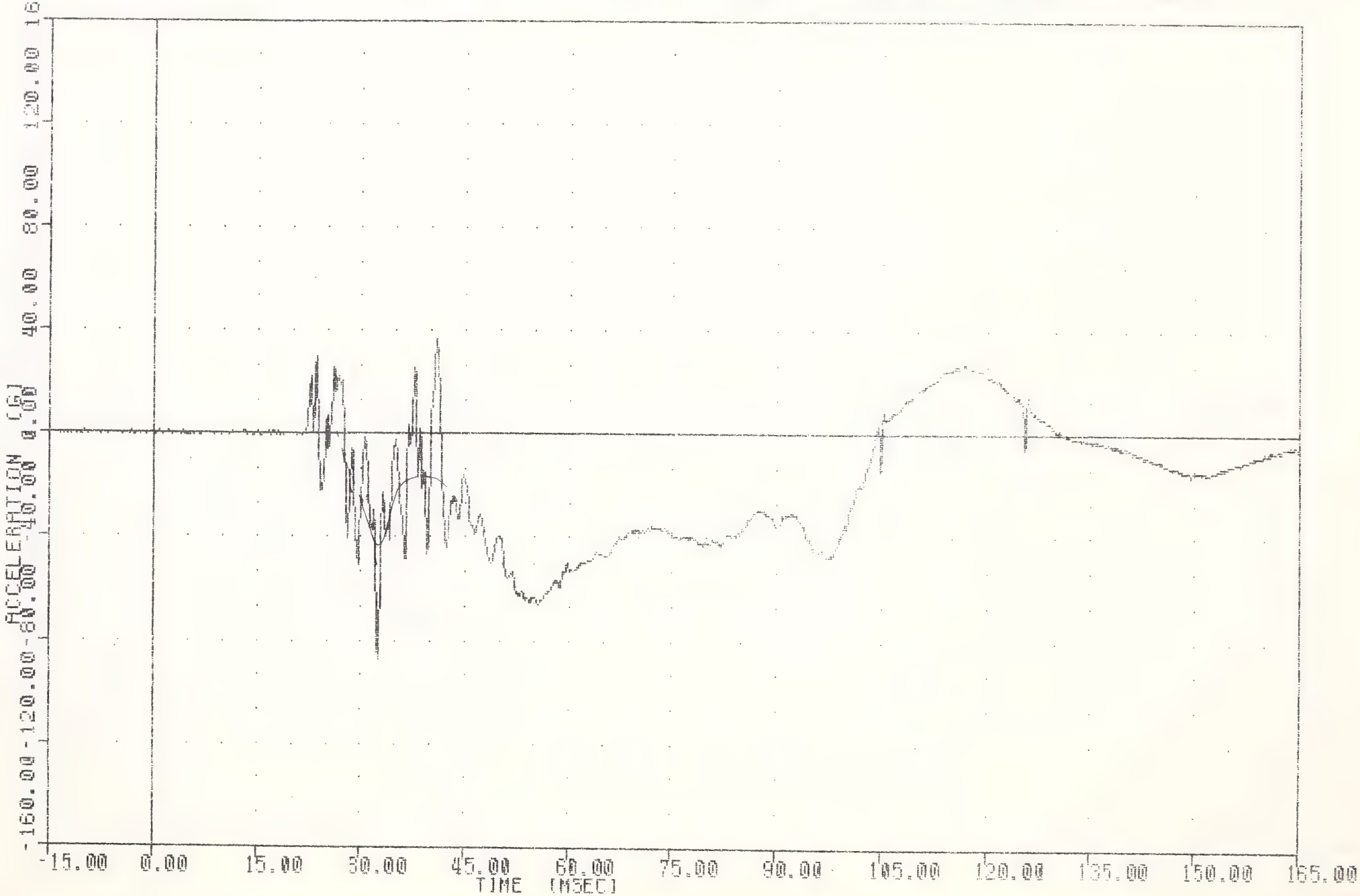


HEAD ACCELERATION Y AXIS PASSENGER

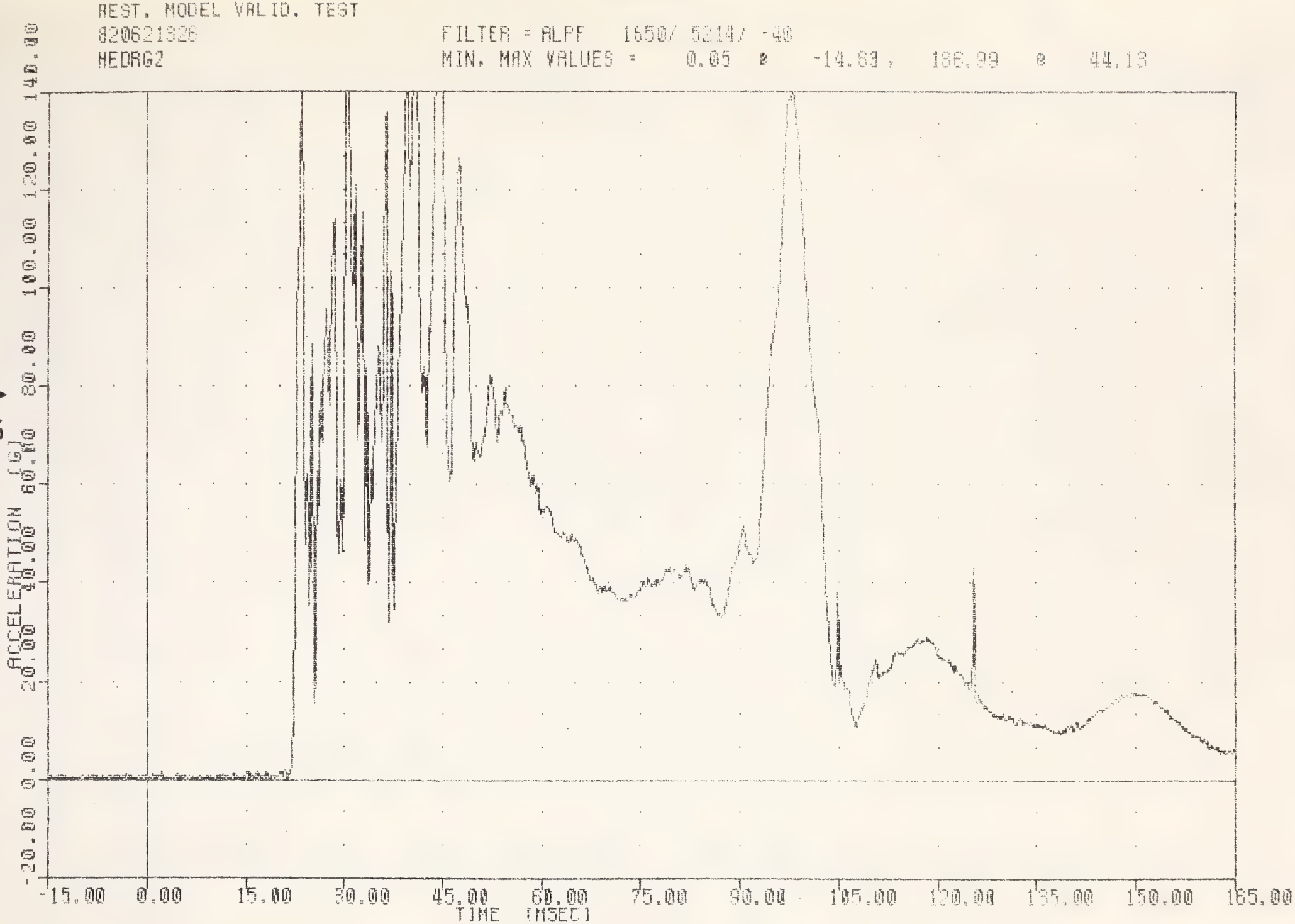
S51015003
REST. MODEL VALID. TEST
820621326
HEDZG2

16-MAR-82 08:29:35

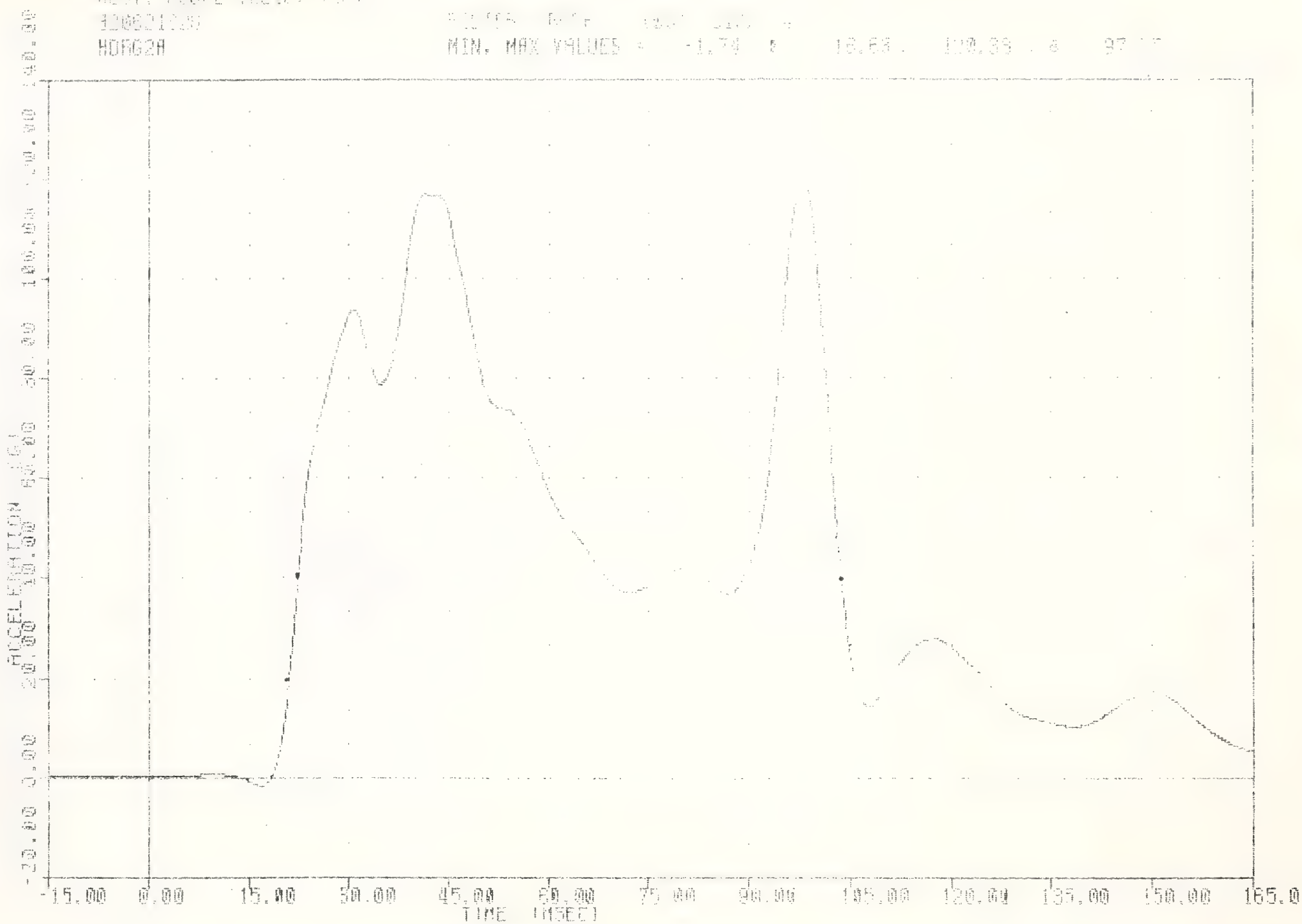
FILTER = ALPF 1650/ 5214/ -40
MIN. MAX VALUES = -86.89 @ 51.38 , 86.69 @ 40.63



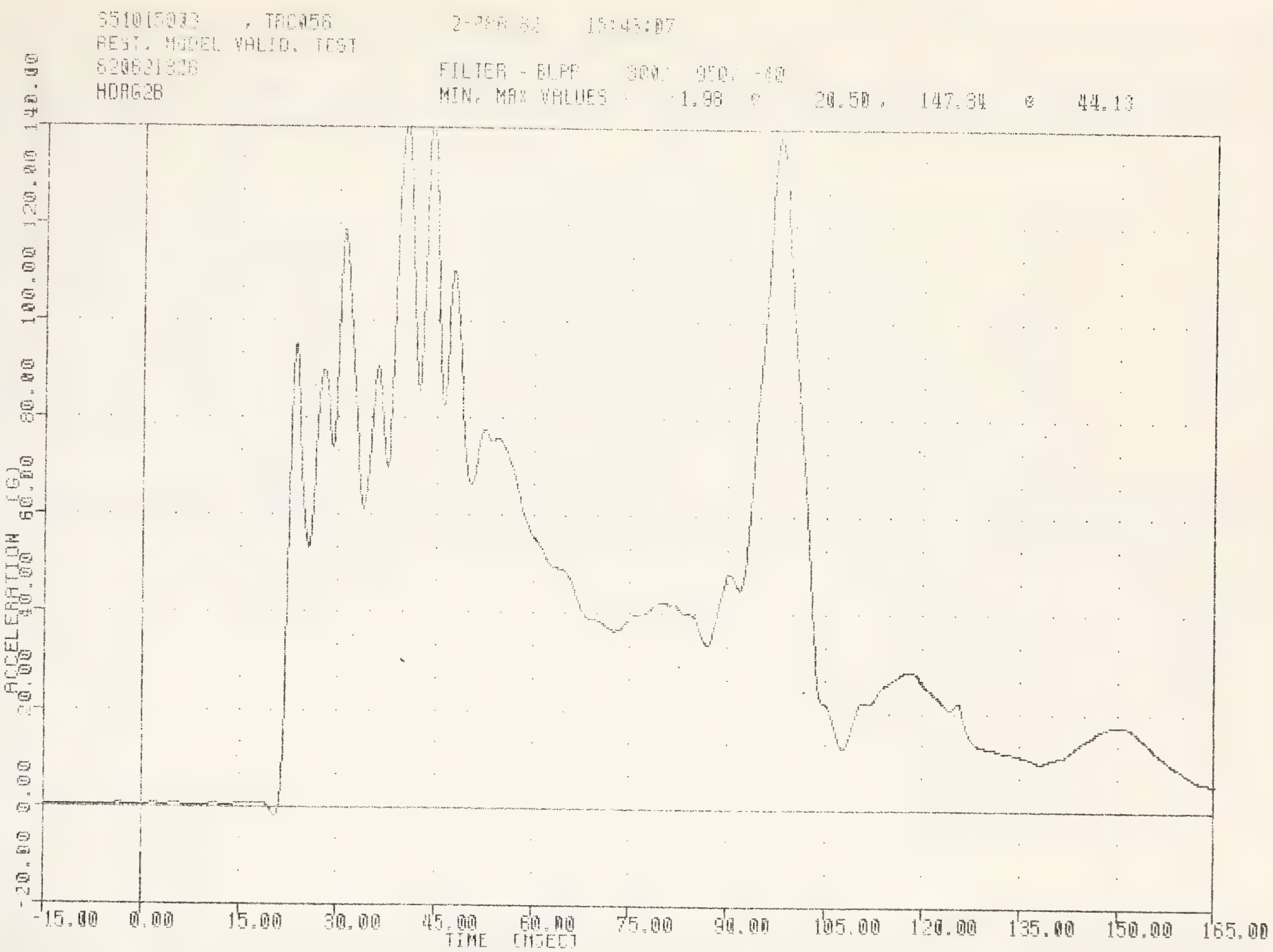
HEAD ACCELERATION Z AXIS PASSENGER



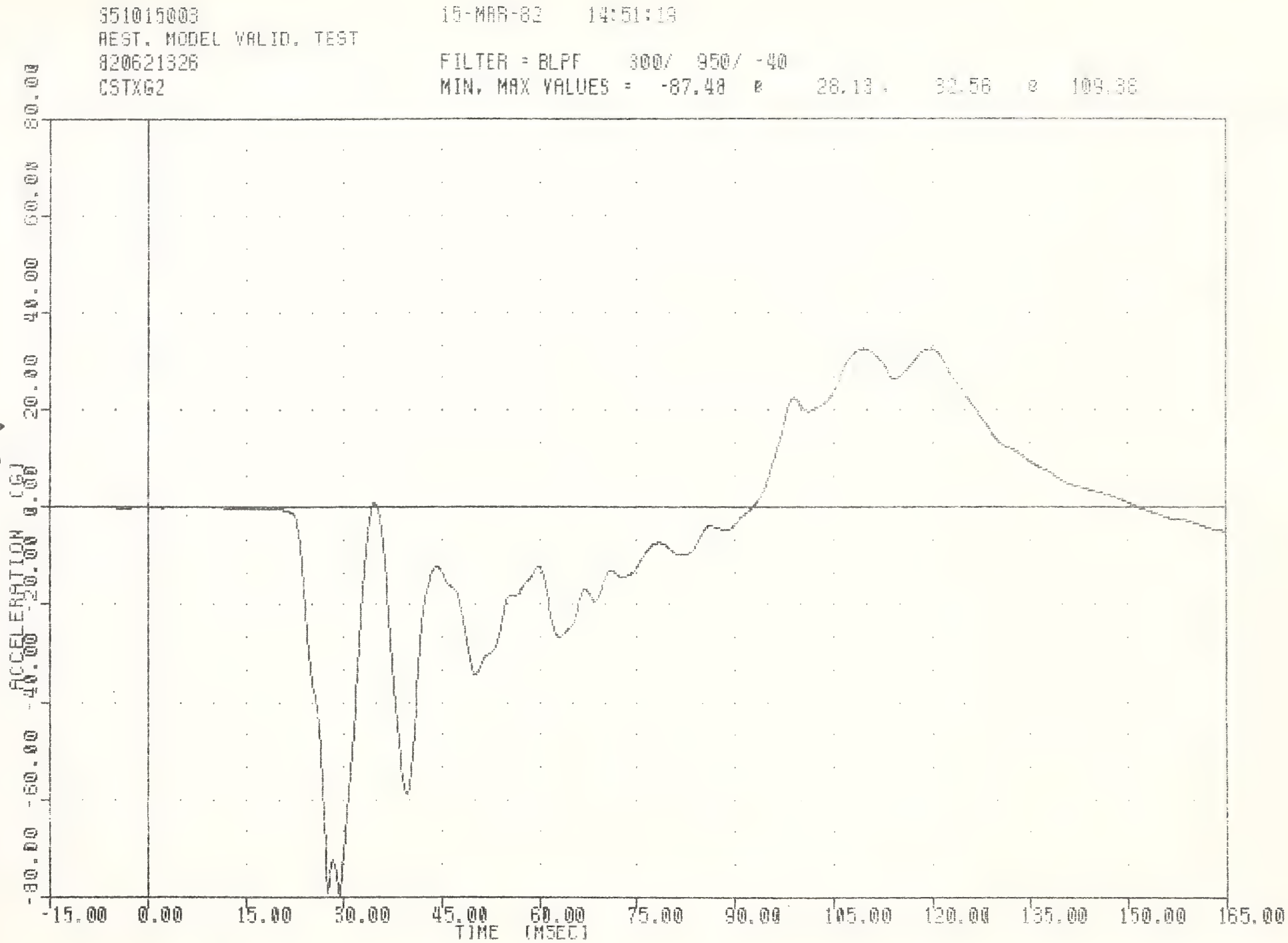
HEAD ACCELERATION RESULTANT PASSENGER



3 YR OLD HEAD RESULTANT (CIVIS) 1001

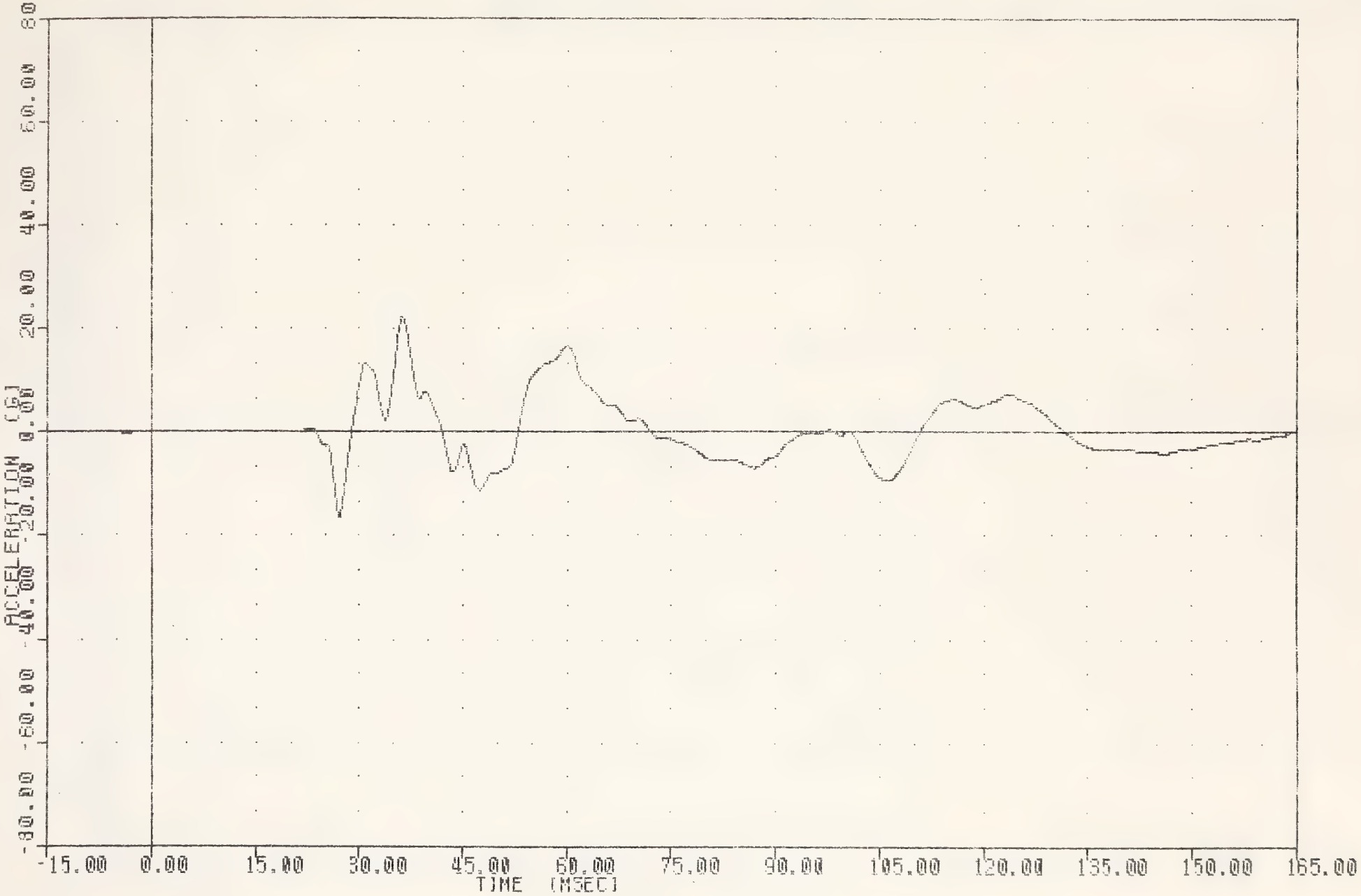


3 YR OLD HEAD RESULTANT (CLASS 180)



CHEST ACCELERATION X AXIS PASSENGER

S51015003 15-MAR-82 14:51:19
REGT. MODEL VALID. TEST
820621326 FILTER = BLPF 300/ 950/ -40
CSTYG2 MIN. MAX VALUES = -16.29 @ 27.00 , 22.21 @ 36.00



CHEST ACCELERATION Y AXIS PASSENGER

551015003 15-MAR-82 14:51:19
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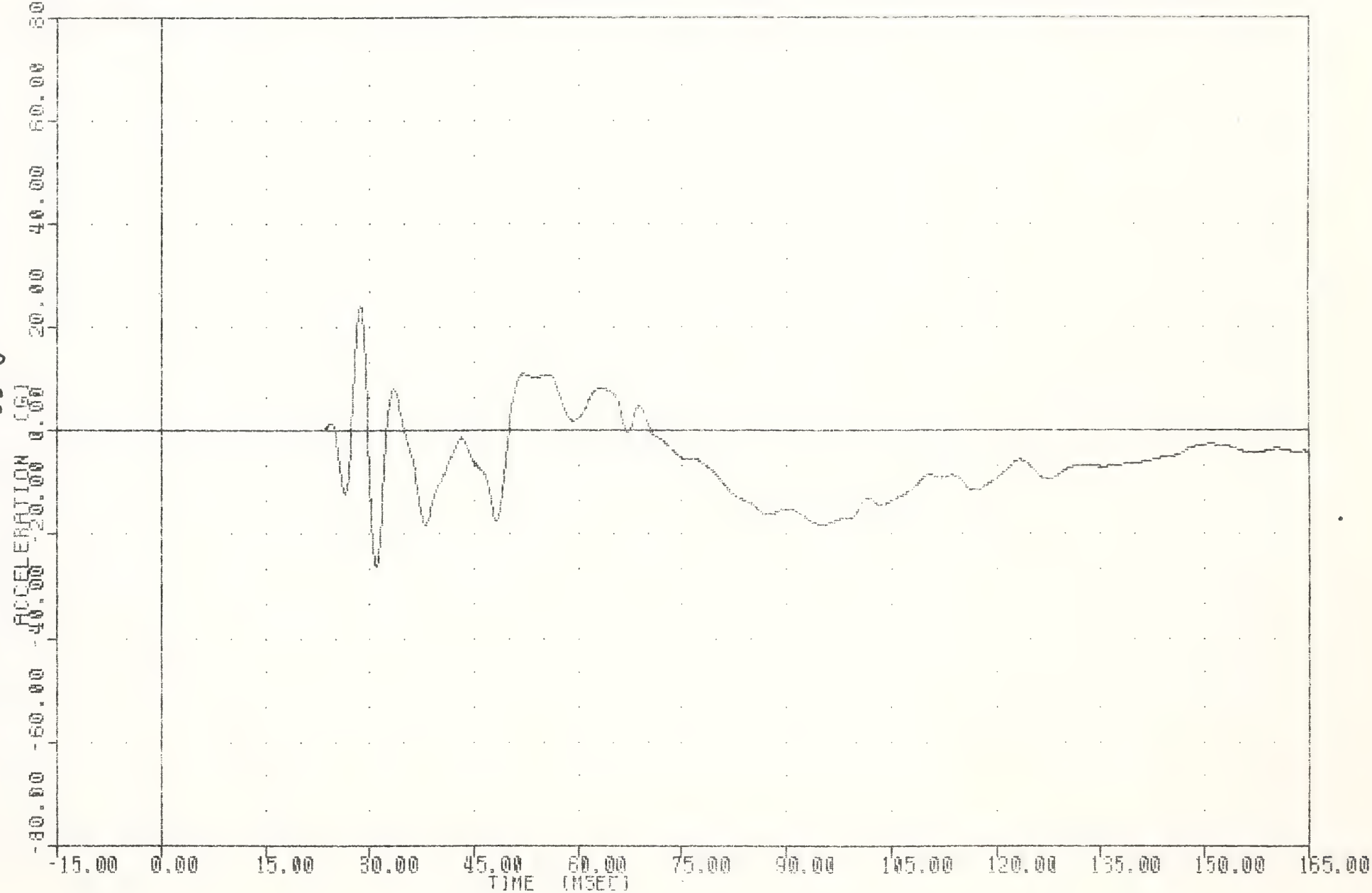
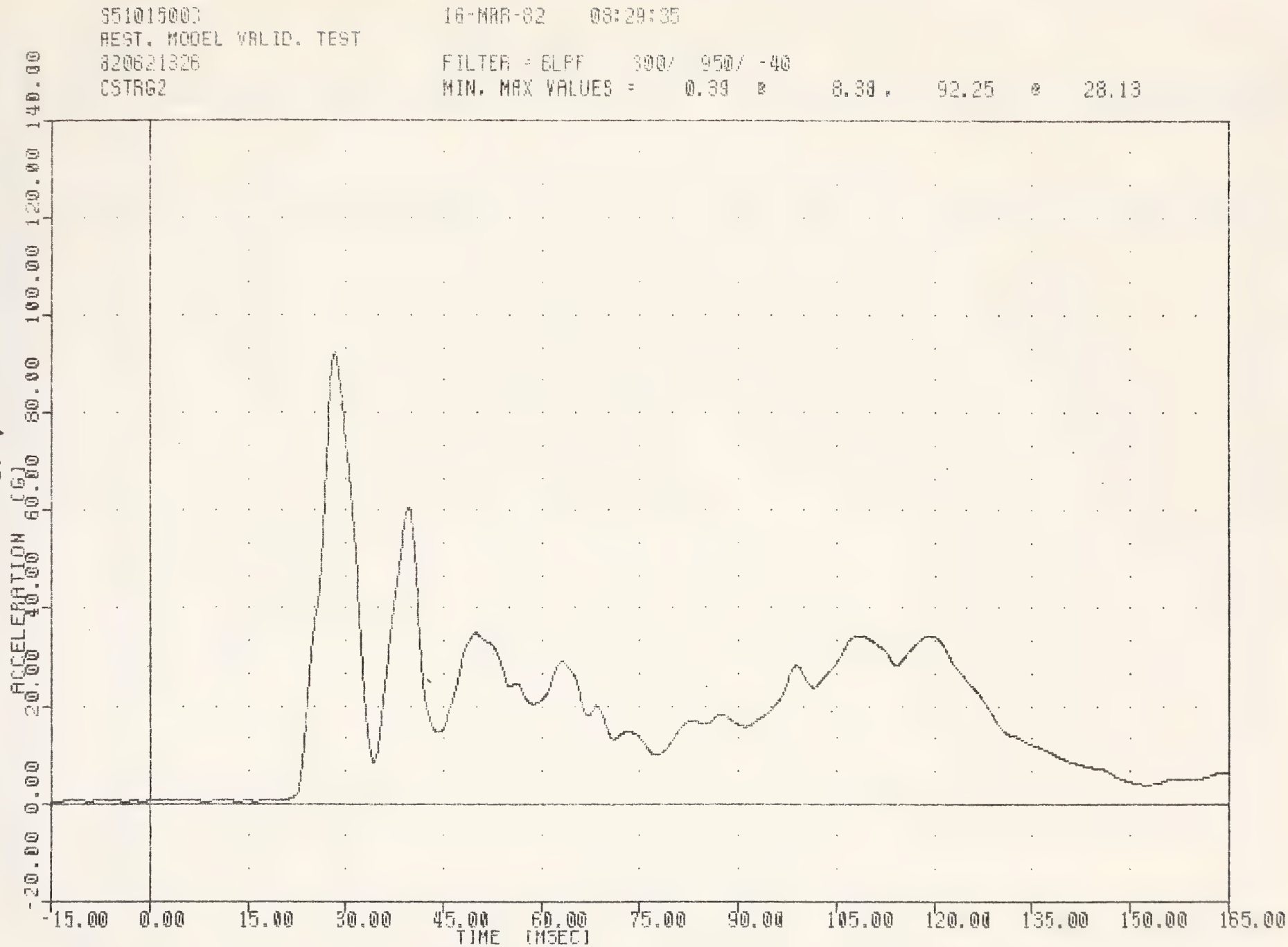
CSTZG2 MIN, MAX VALUES = -26.06 @ 30.75 , 24.14 @ 28.38



CHEST ACCELERATION Z AXIS PASSENGER



CHEST ACCELERATION RESULTANT PASSENGER

S51015003 16-MAR-82 08:39:25
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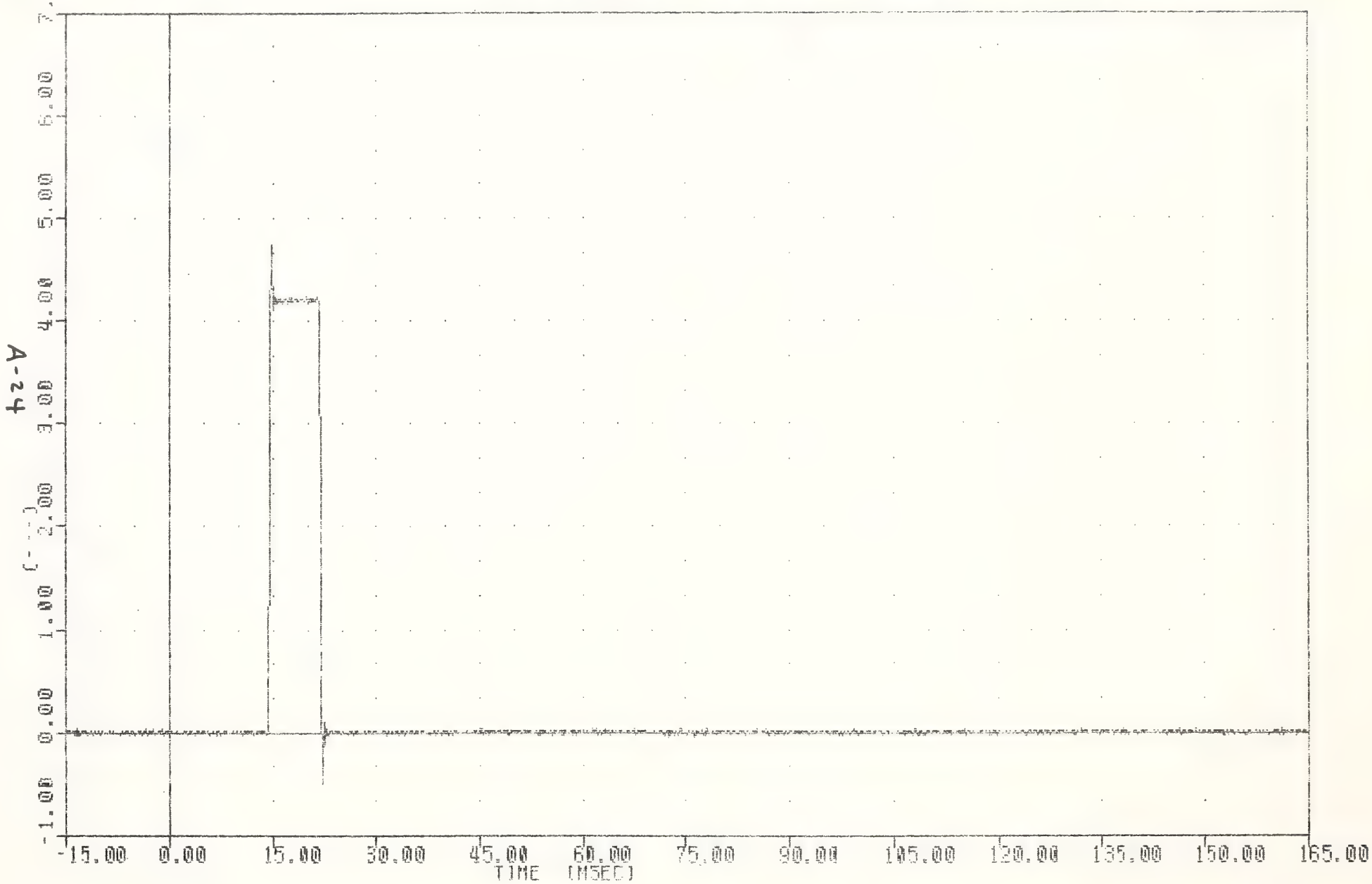
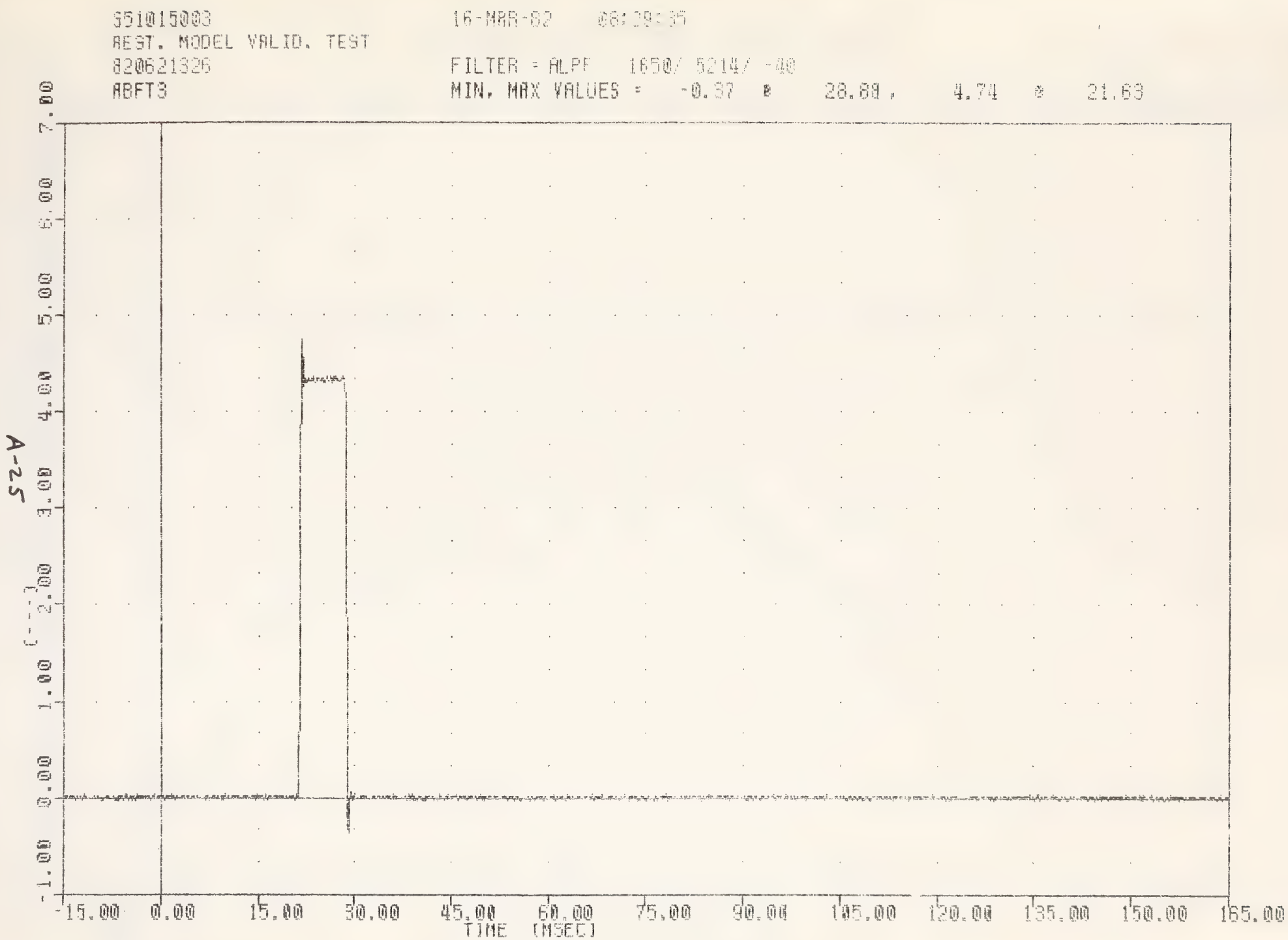
ABFT2 MIN, MAX VALUES = -0.50 @ 22.00 , 4.74 @ 14.83



AIR BAG FIRING EVENT PASSENGER



AIR BAG FIRING EVENT 3

S51015003 16-MAR-82 08:28:35
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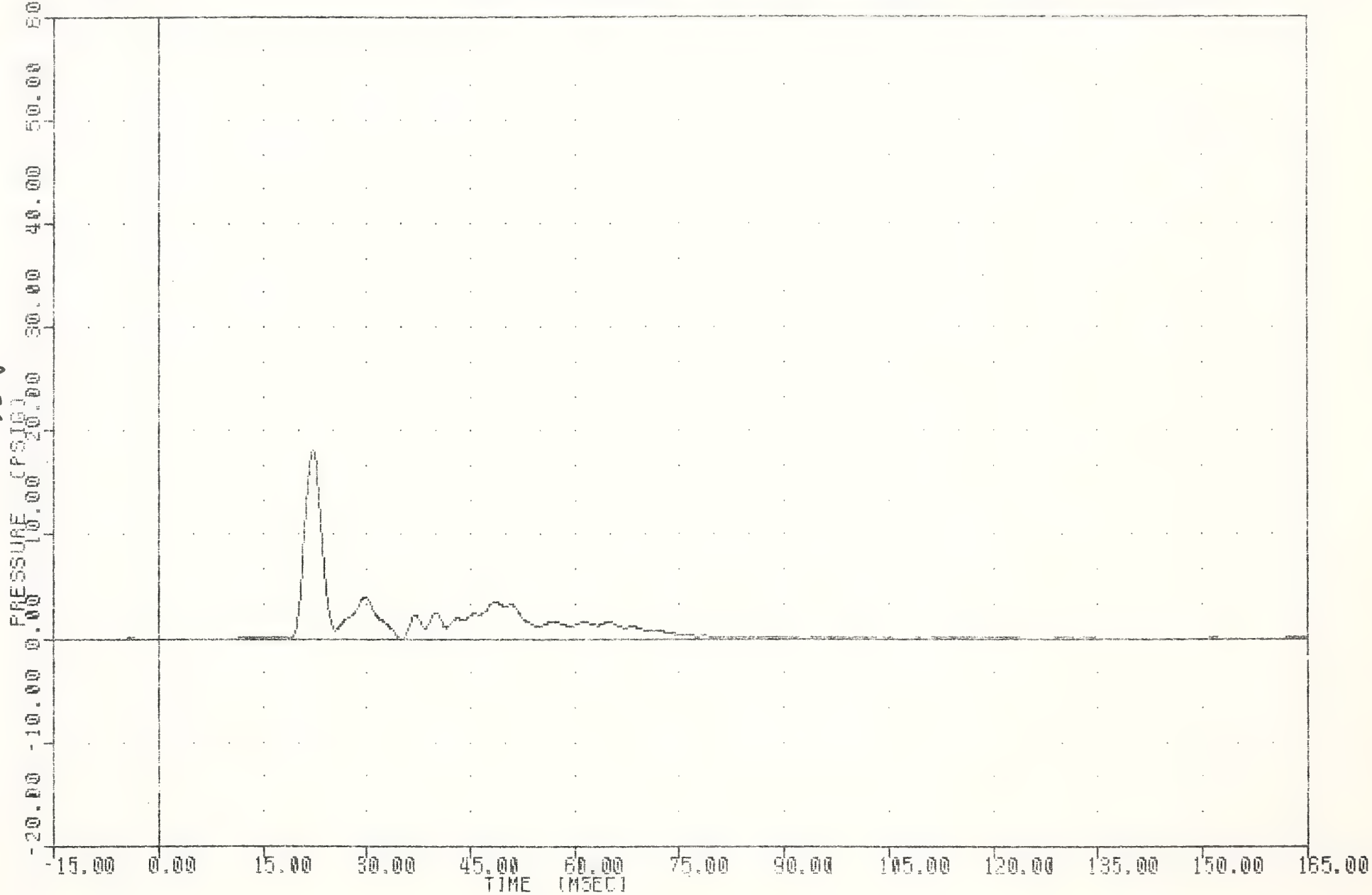
ABP2 MIN. MAX VALUES = -0.10 @ 34.86 , 16.15 @ 22.00



AIR BAG PRESSURE PASSENGER

S51015003 16-MAR-82 08:29:35
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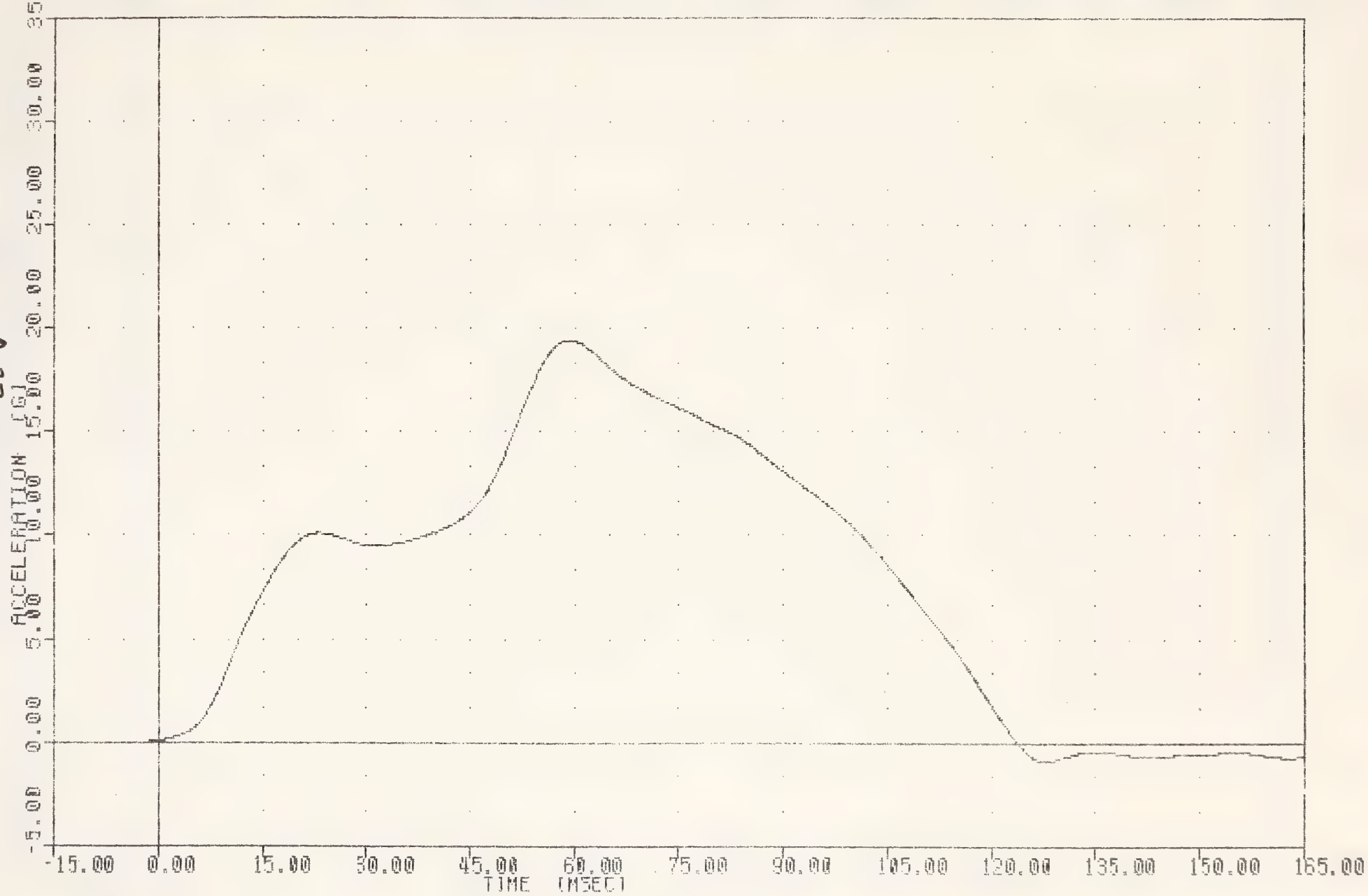
SLDXG MIN, MAX VALUES = -0.90 @ 127.63 , 19.40 @ 59.00



SLED ACCELERATION

S51015003 16-MAR-82 09:04:49
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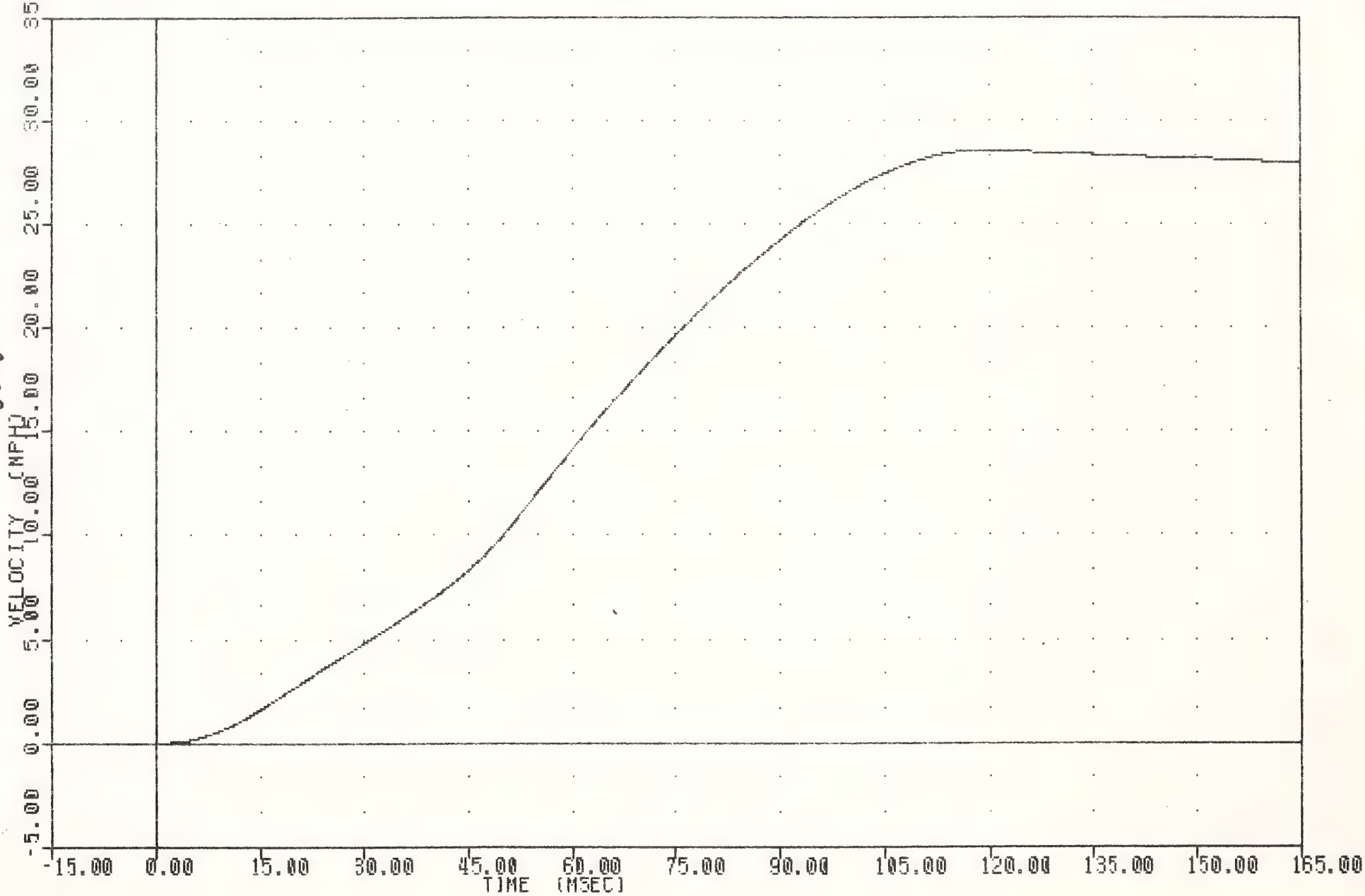
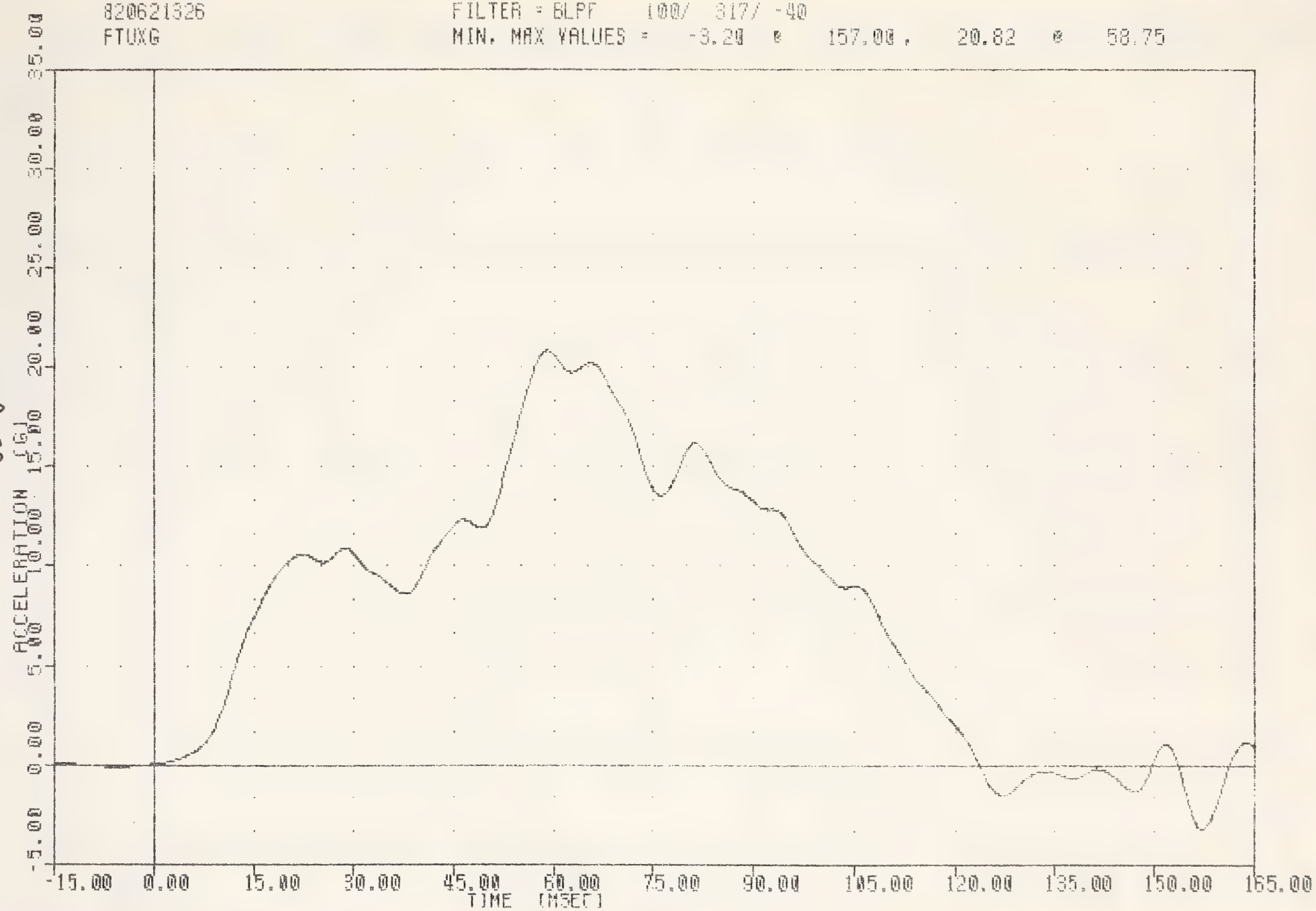
SLDXV1 MIN. MAX VALUES = -0.03 @ -6.75 , 28.54 @ 119.50



INTEGRATED SLED VELOCITY



FLOOR PAN TUNNEL ACCELERATION

S51015003 15-MAR-82 16:02:[illegible]
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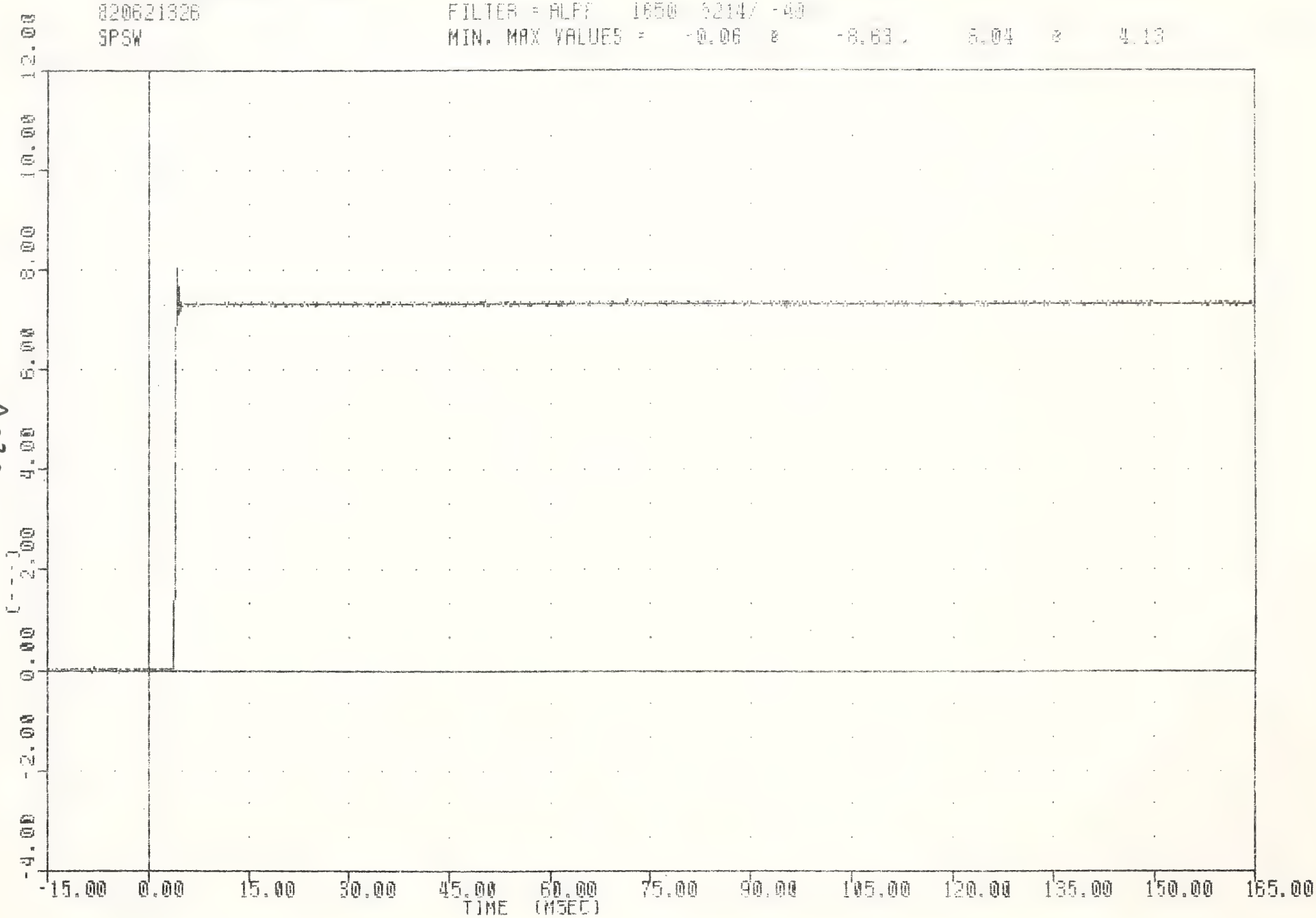
SPSW MIN. MAX VALUES = -0.06 @ -8.63 , 6.04 @ 4.13



SLED POSITION SWITCH

TEST NO. 2

S51025003 15-MAR-82 15:58:47
BEST. MODEL VALID. TEST
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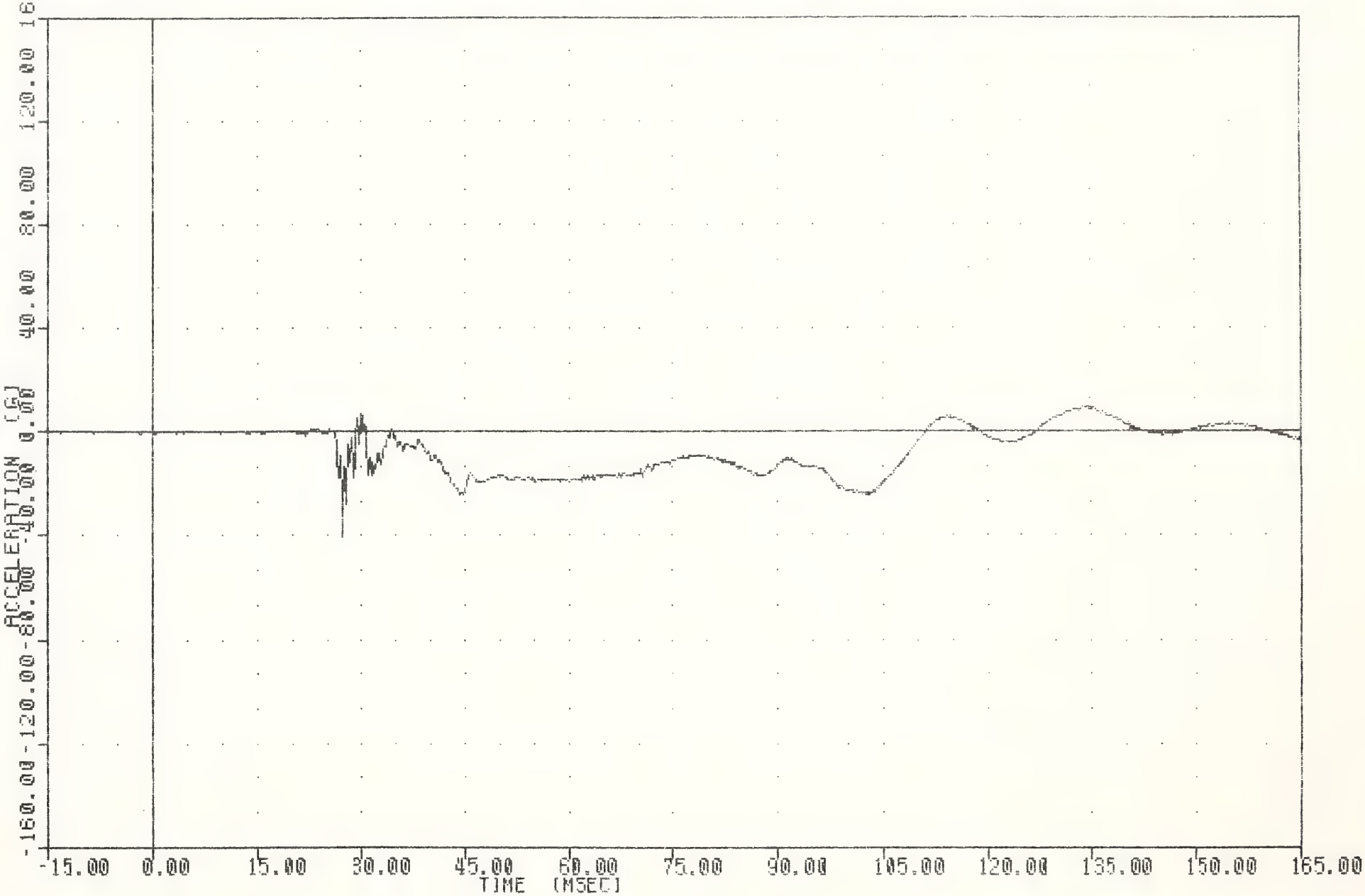
HEDXG1 MIN. MAX VALUES = -40.74 @ 27.13 , 9.73 @ 134.25



HEAD ACCELERATION X AXIS DRIVER

S51025003 15-MAR-82 15:58:47
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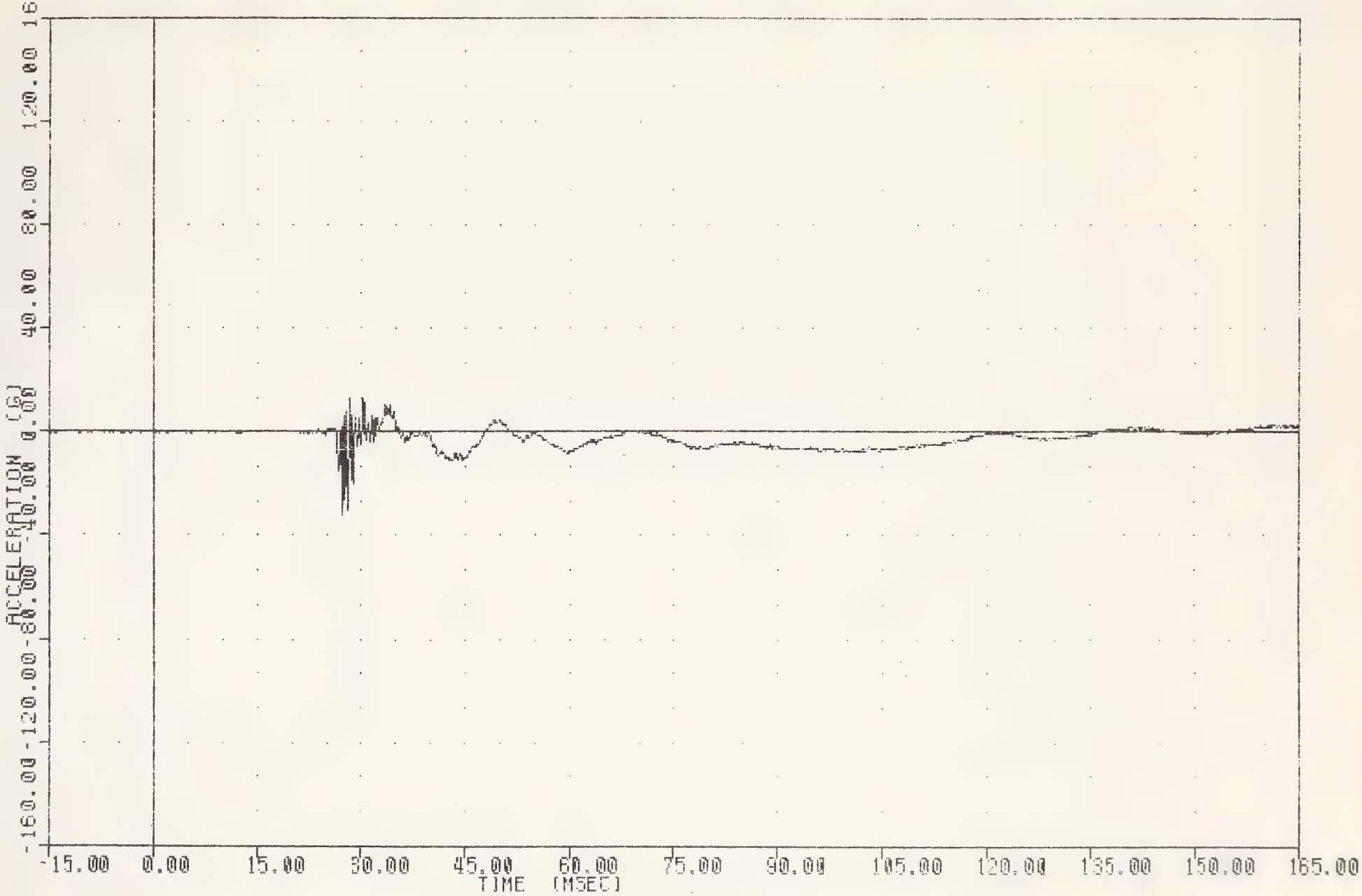
HEDYG1 MIN. MAX VALUES = -31.63 @ 27.25 , 12.71 @ 28.25



HEAD ACCELERATION Y AXIS DRIVER

351025003 15-MAR-82 15:58:49
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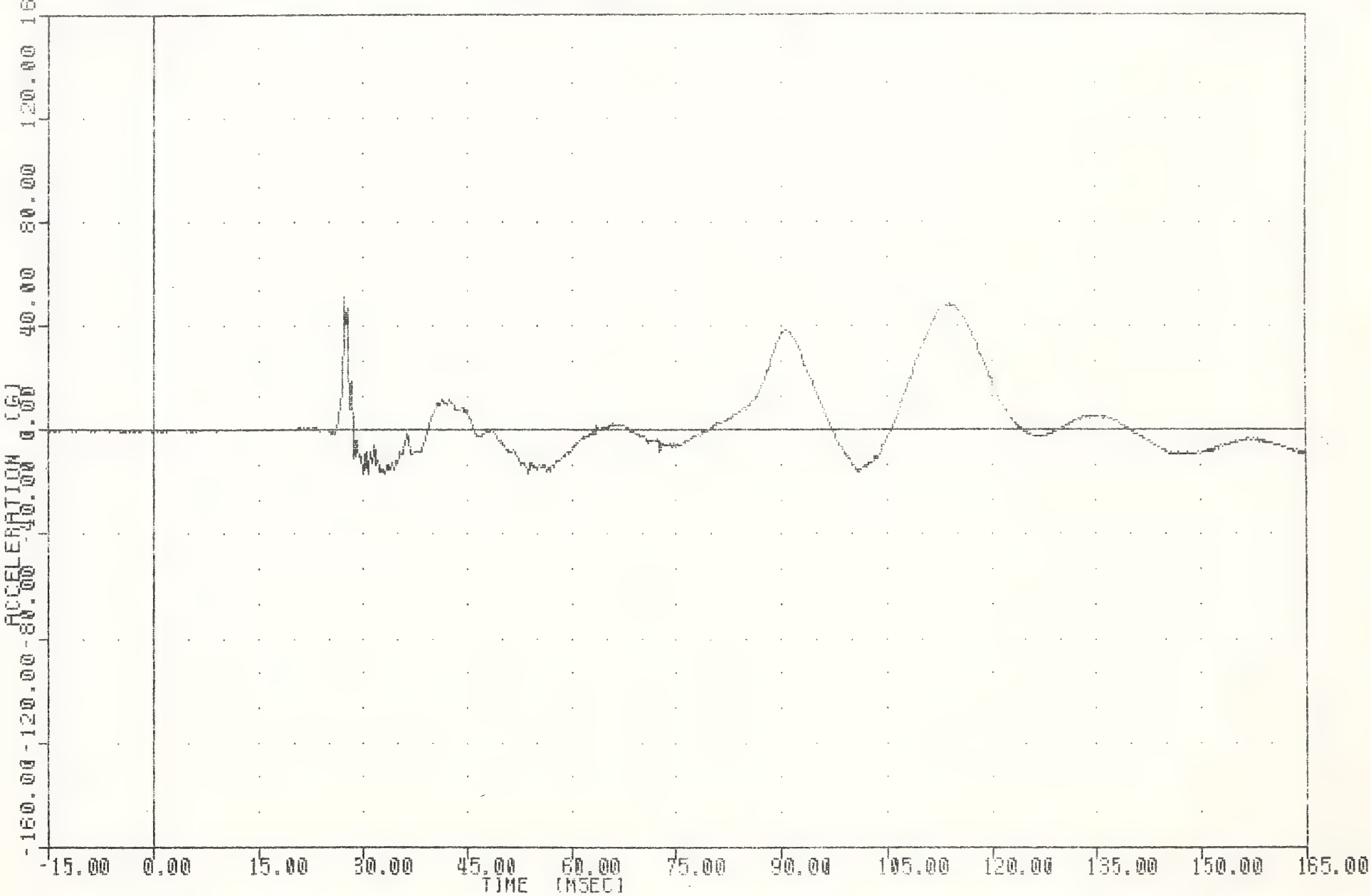
HEDZG1 MIN, MAX VALUES = -17.03 @ 30.50 , 31.45 @ 37.13



HEAD ACCELERATION Z AXIS DRIVER

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
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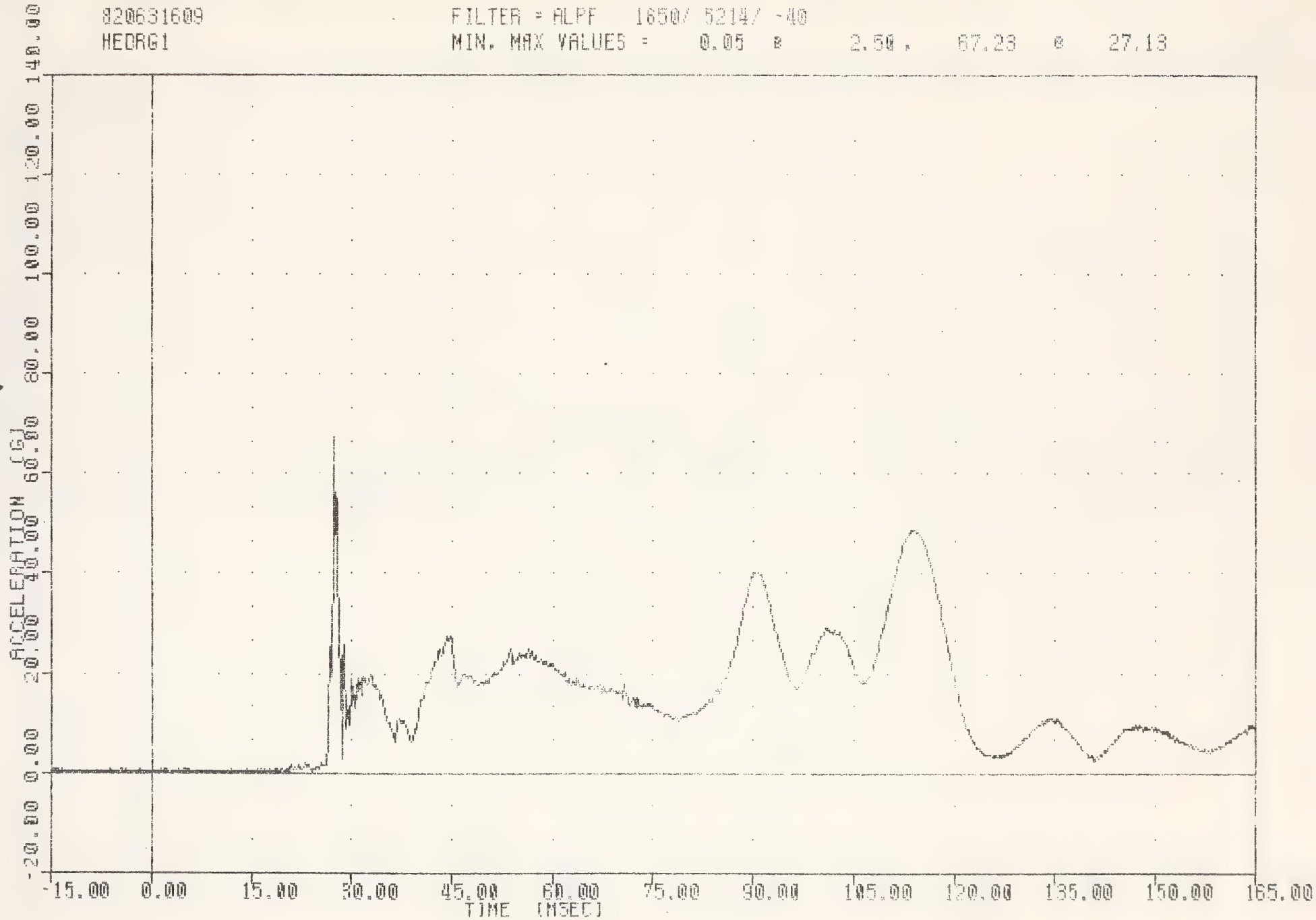
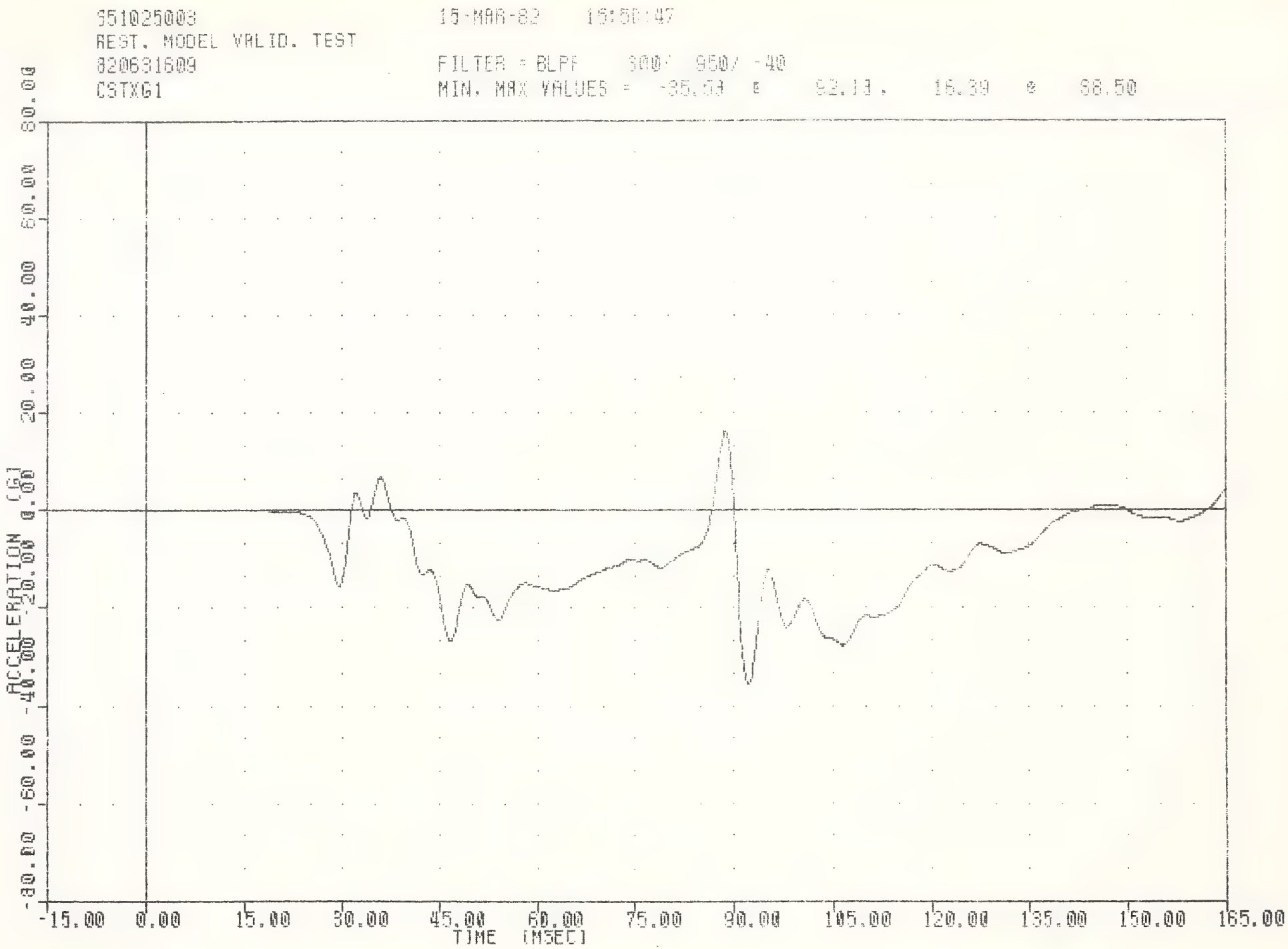
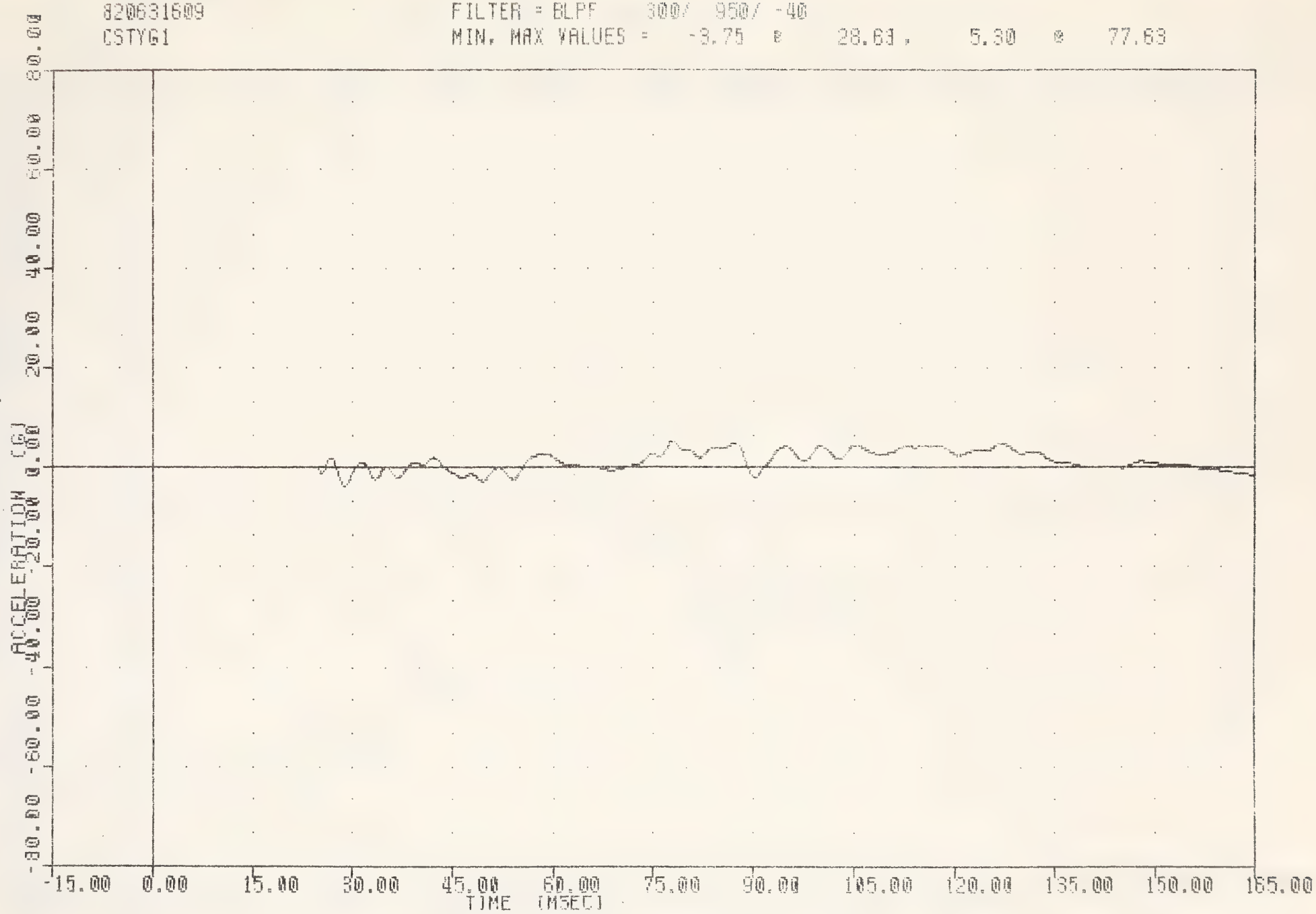
HEDRG1 MIN. MAX VALUES = 0.05 @ 2.50 , 67.23 @ 27.13



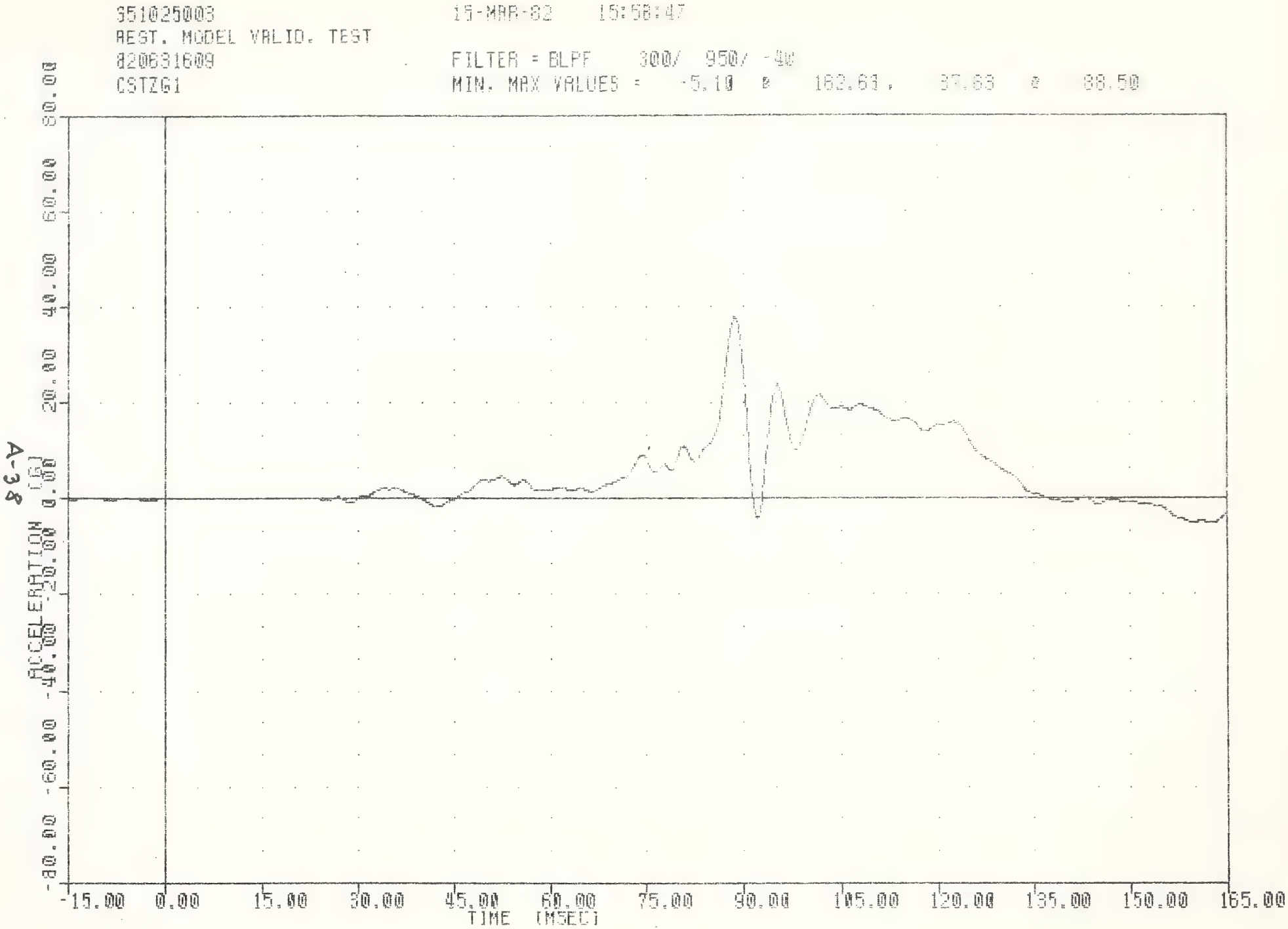
DRIVER HEAD RESULTANT



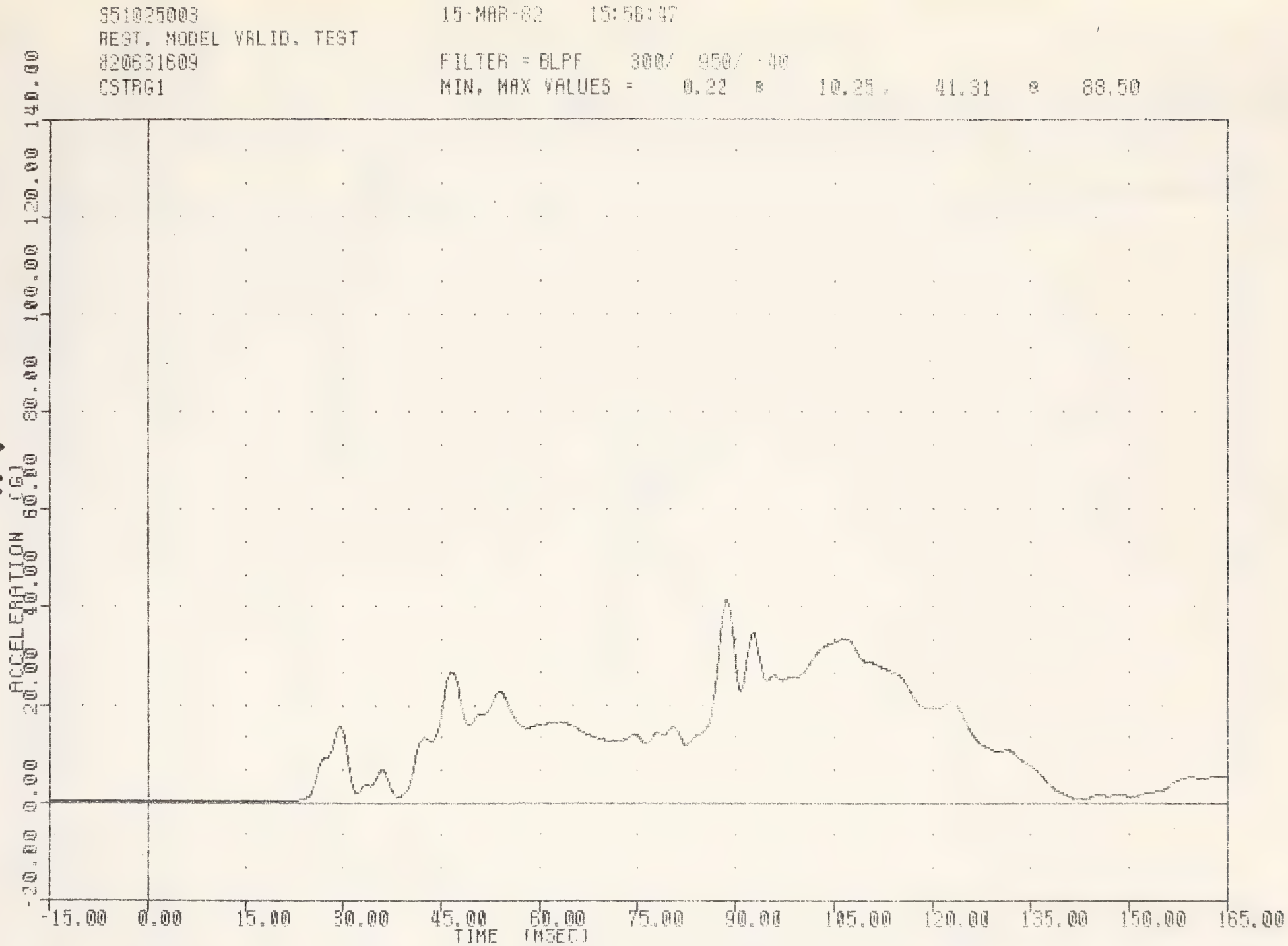
CHEST ACCELERATION X AXIS DRIVER



CHEST ACCELERATION Y AXIS DRIVER

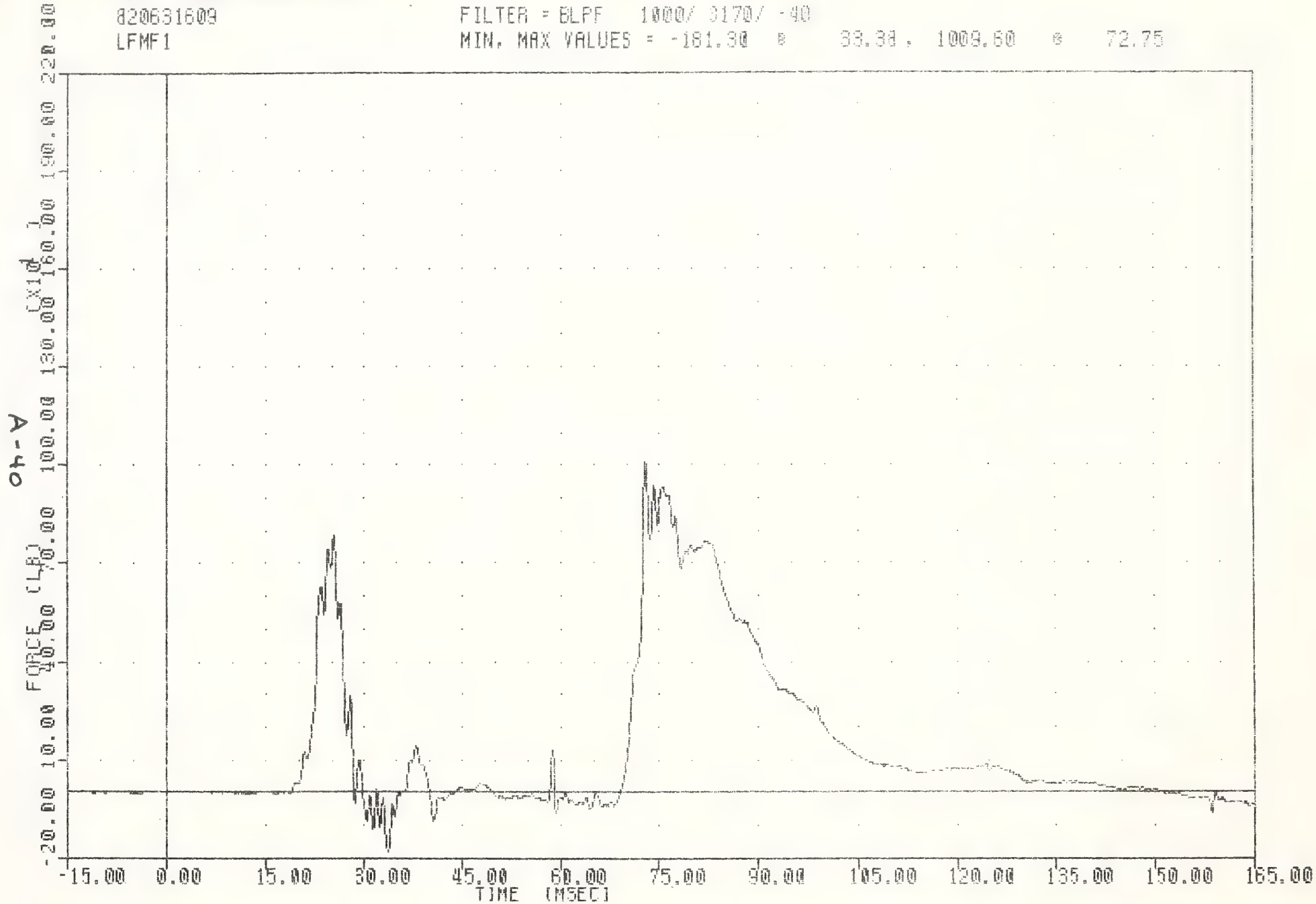


CHEST ACCELERATION Z AXIS DRIVER



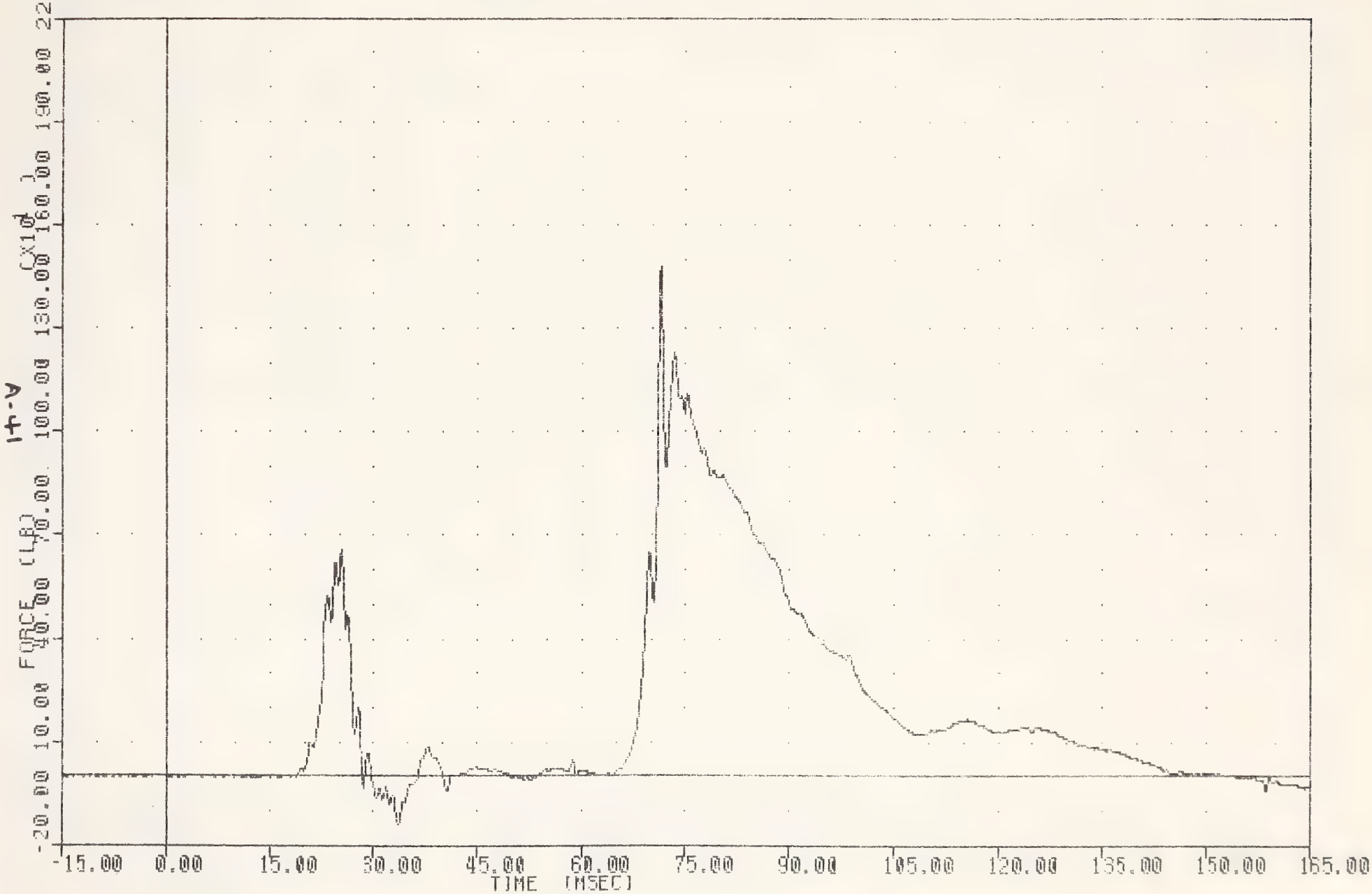
DRIVER CHEST RESULTANT

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 1000/ 3170/ -40
LFMF1 MIN. MAX VALUES = -181.30 @ 38.38 , 1009.60 @ 72.75



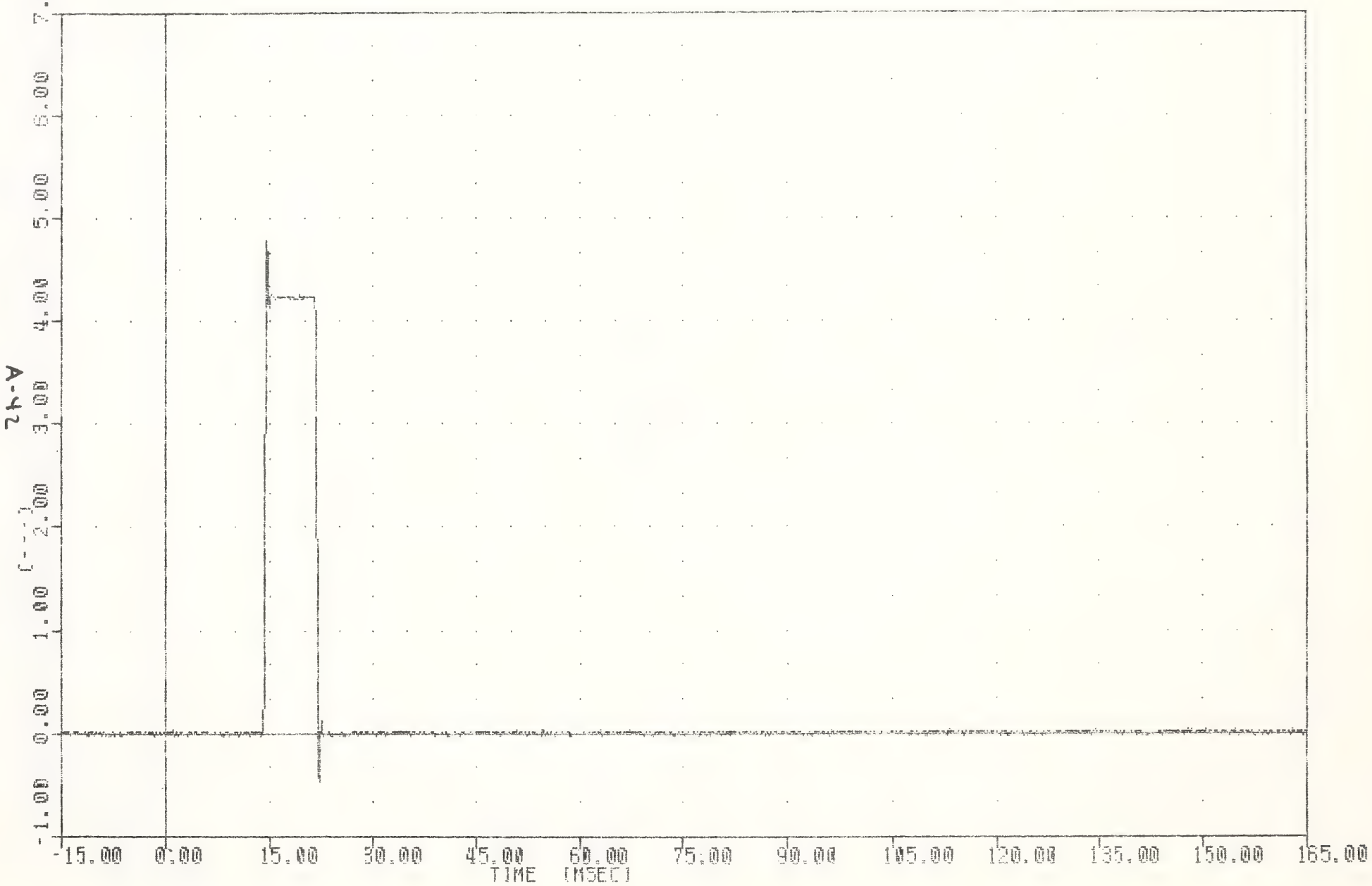
LEFT FEMUR FORCE DRIVER

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 1000/ 3170/ -40
RFMF1 MIN. MAX VALUES = -136.77 @ 38.50 , 1480.26 @ 71.25

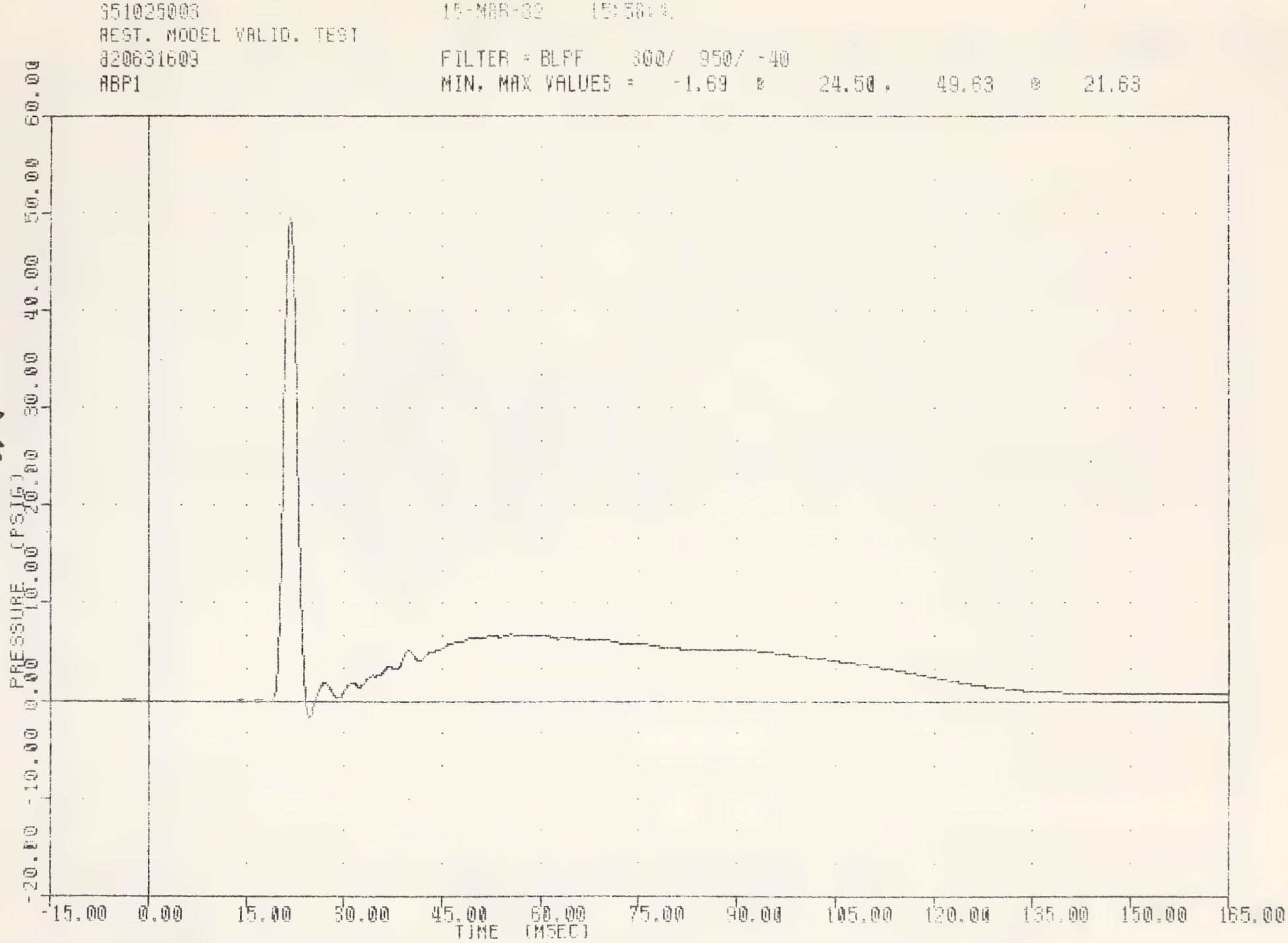


RIGHT FEMUR FORCE DRIVER

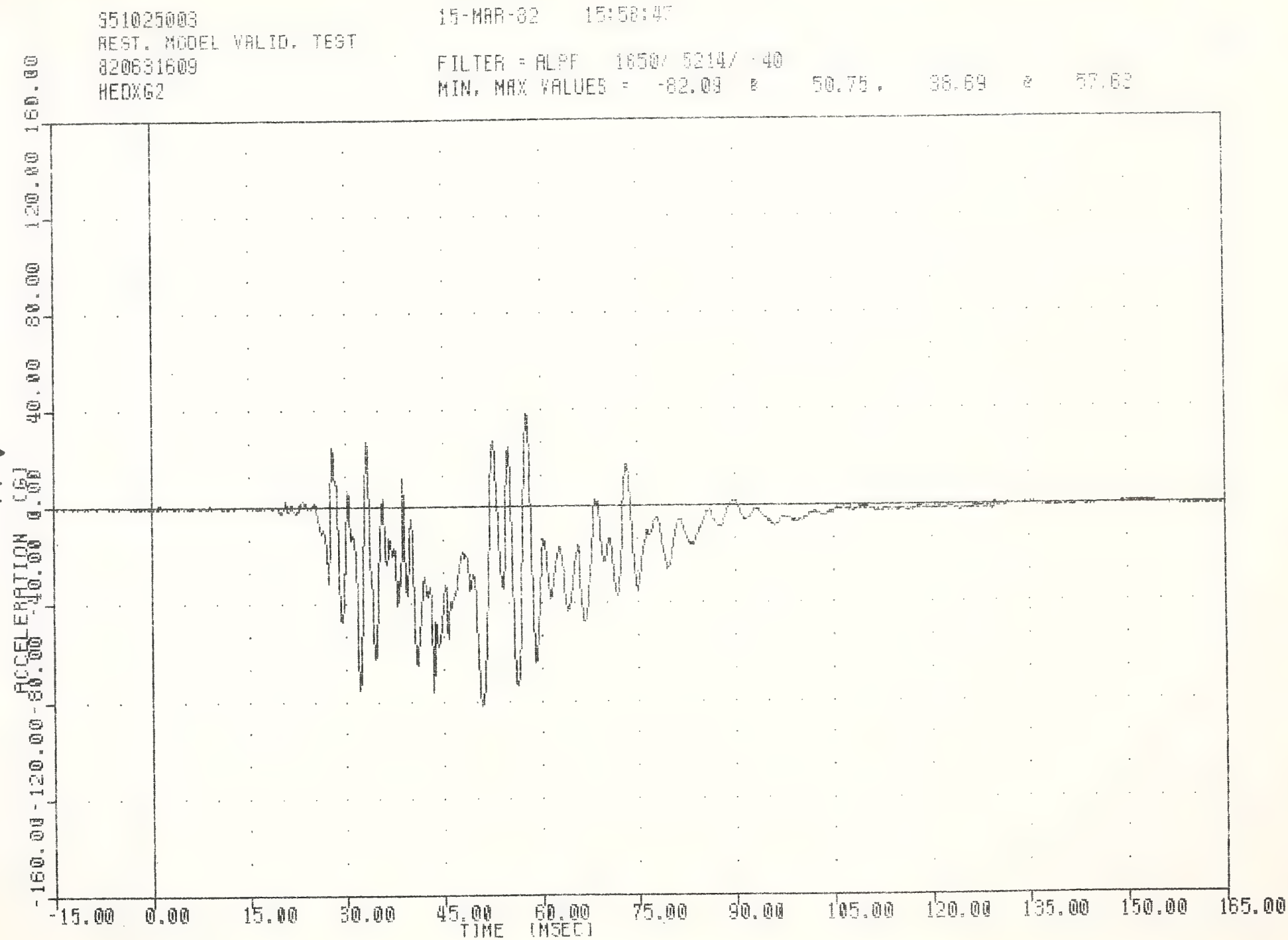
S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = ALPF 1650/ 5214/ -40
ABFT1 MIN. MAX VALUES = -0.48 @ 22.00 , 4.78 @ 14.50



AIR BAG FIRING EVENT DRIVER

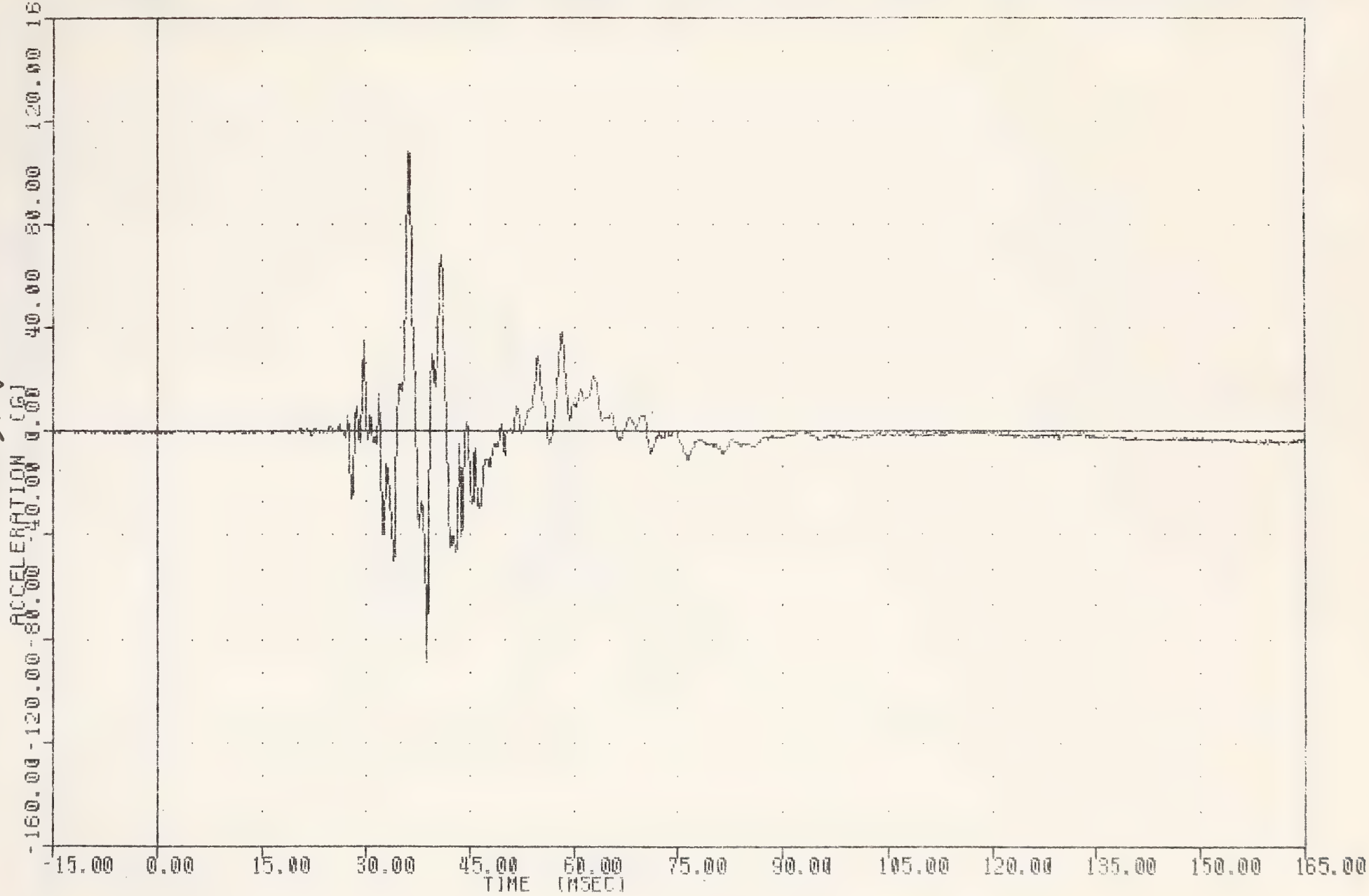


AIR BAG PRESSURE DRIVER

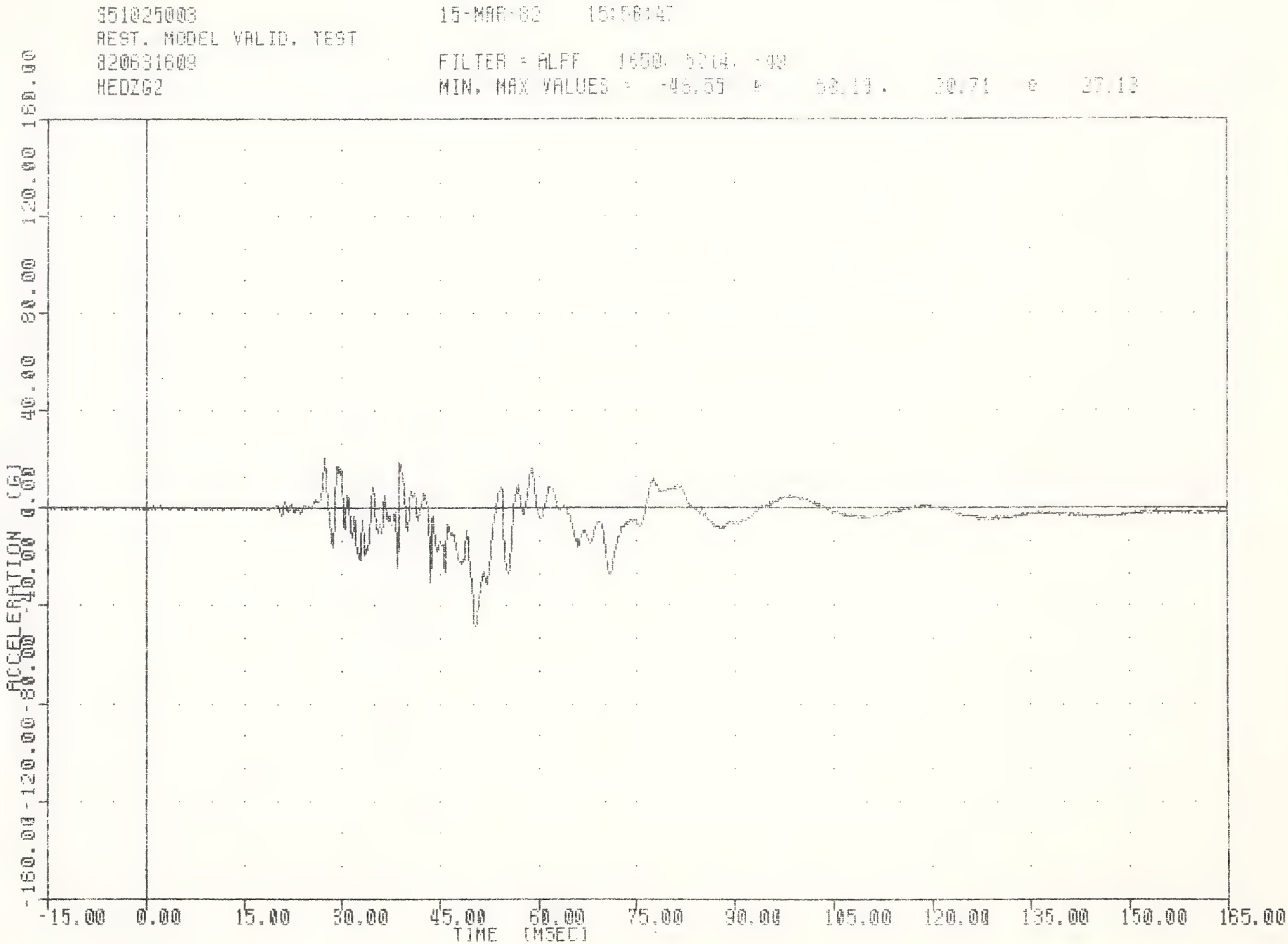


HEAD ACCELERATION X AXIS PASSENGER

S51025003 15-MAR-82 15:58:4
REST. MODEL VALID. TEST
820631609 FILTER = ALPF 1650/ 5214/ -40
HEDYG2 MIN. MAX VALUES = -88.75 @ 38.50 , 108.37 @ 35.88

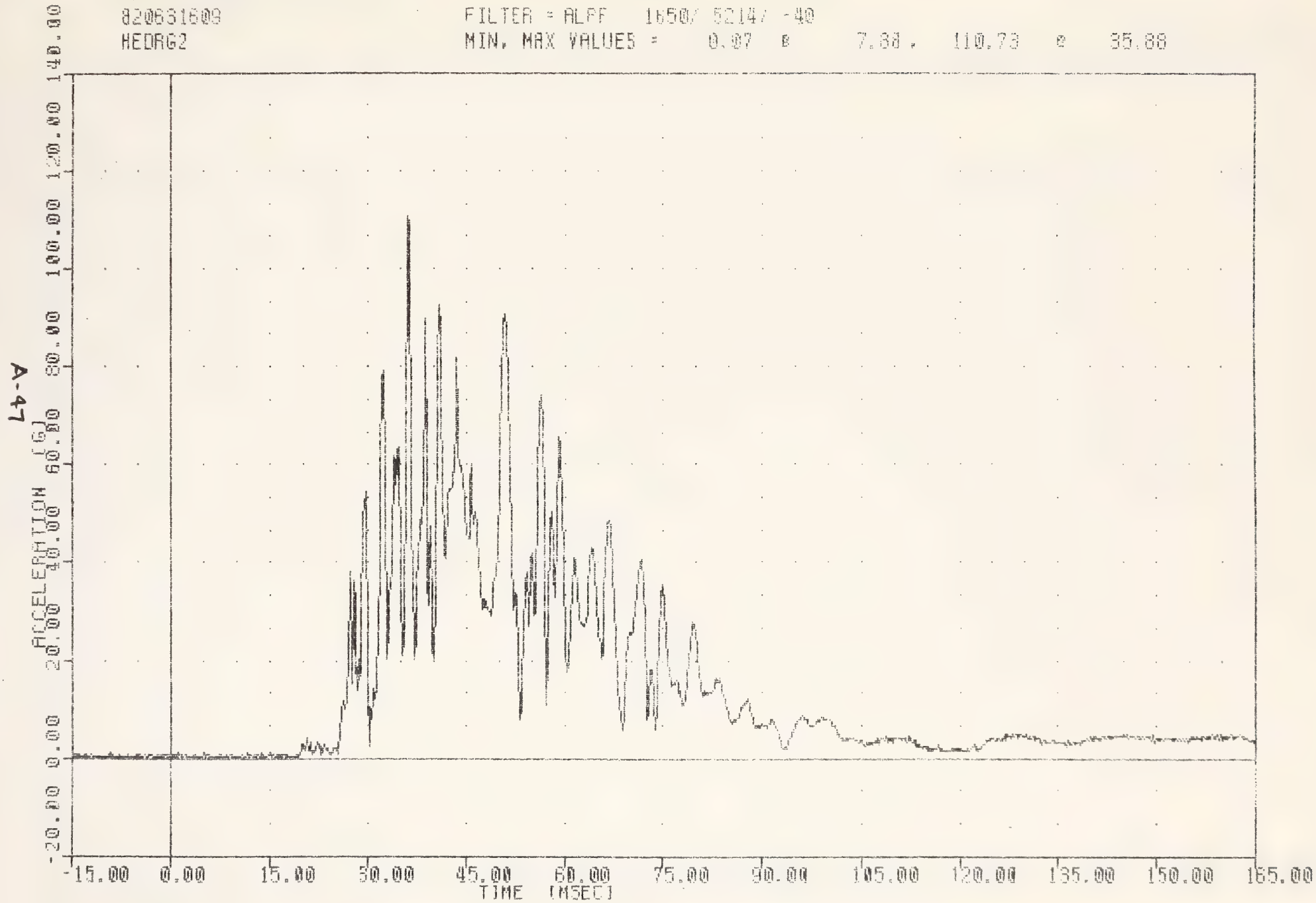


HEAD ACCELERATION Y AXIS PASSENGER

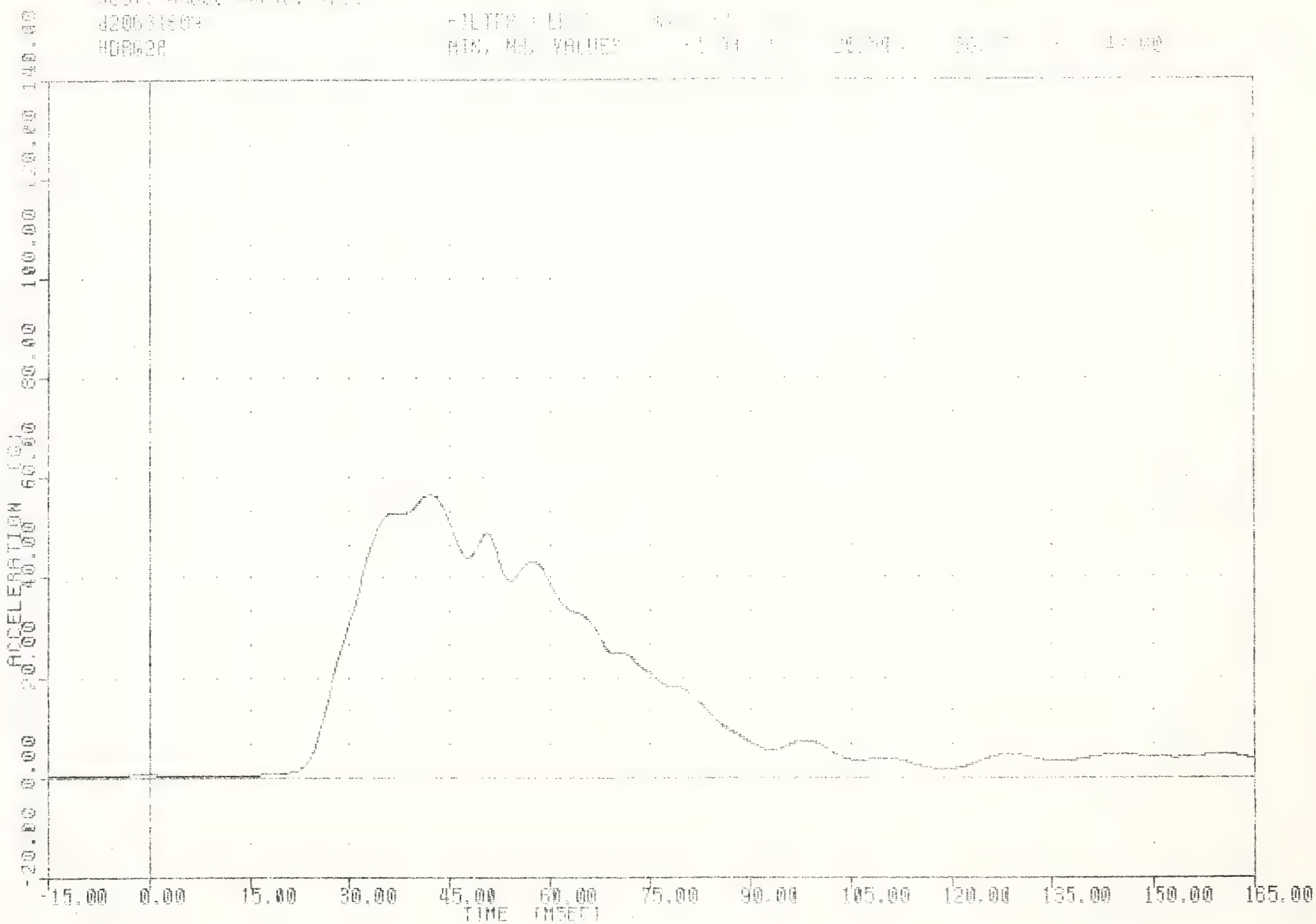


HEAD ACCELERATION Z AXIS PASSENGER

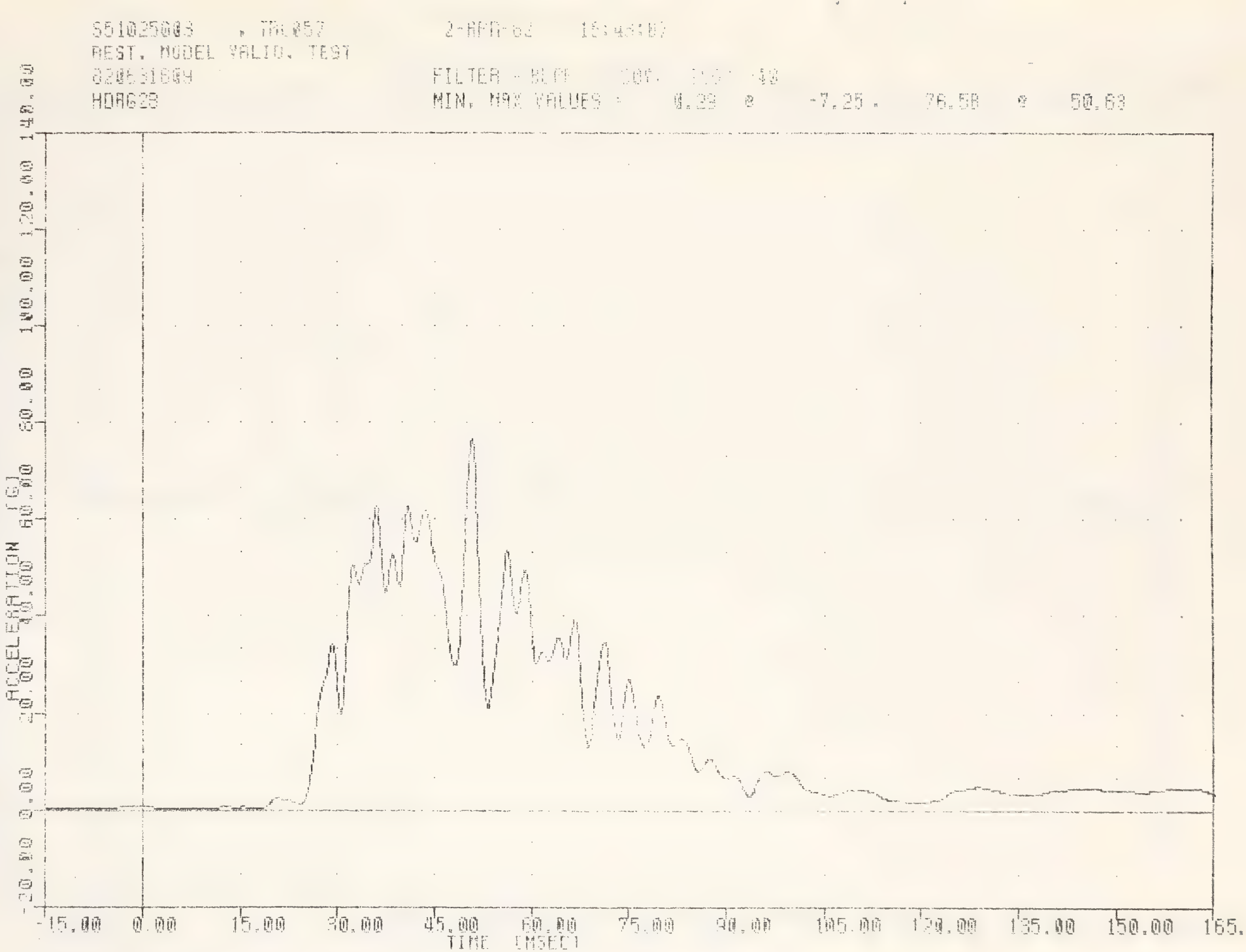
S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631608 FILTER = ALPF 1650/ 5214/ -40
HEDRG2 MIN. MAX VALUES = 0.07 @ 7.38 , 110.73 @ 35.88



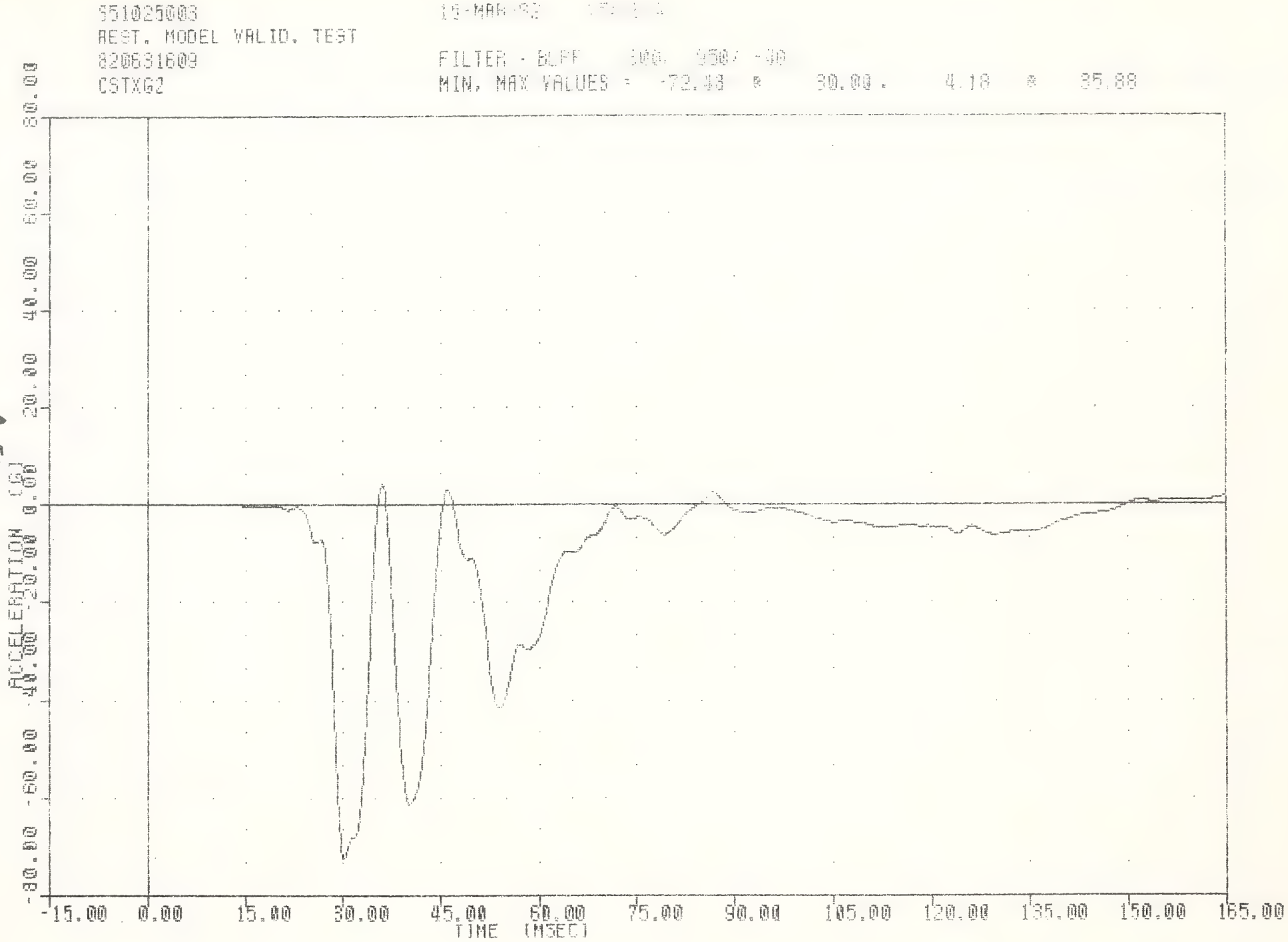
PASS HEAD RESULTANT



3 YR OLD HEAD RESULTANT (CLASS 100)

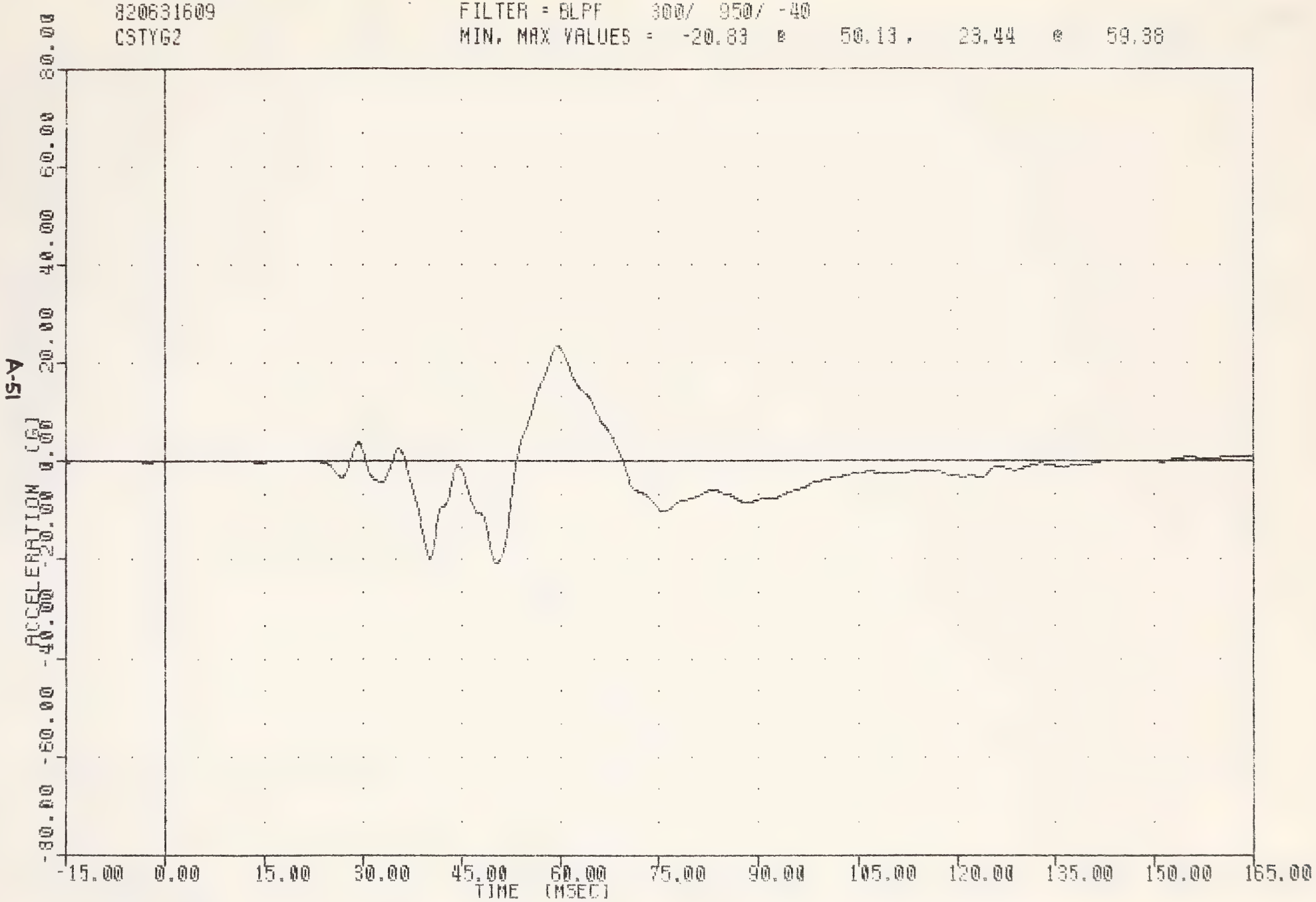


3 YR OLD HEAD RESULTANT (CLASS 1801)



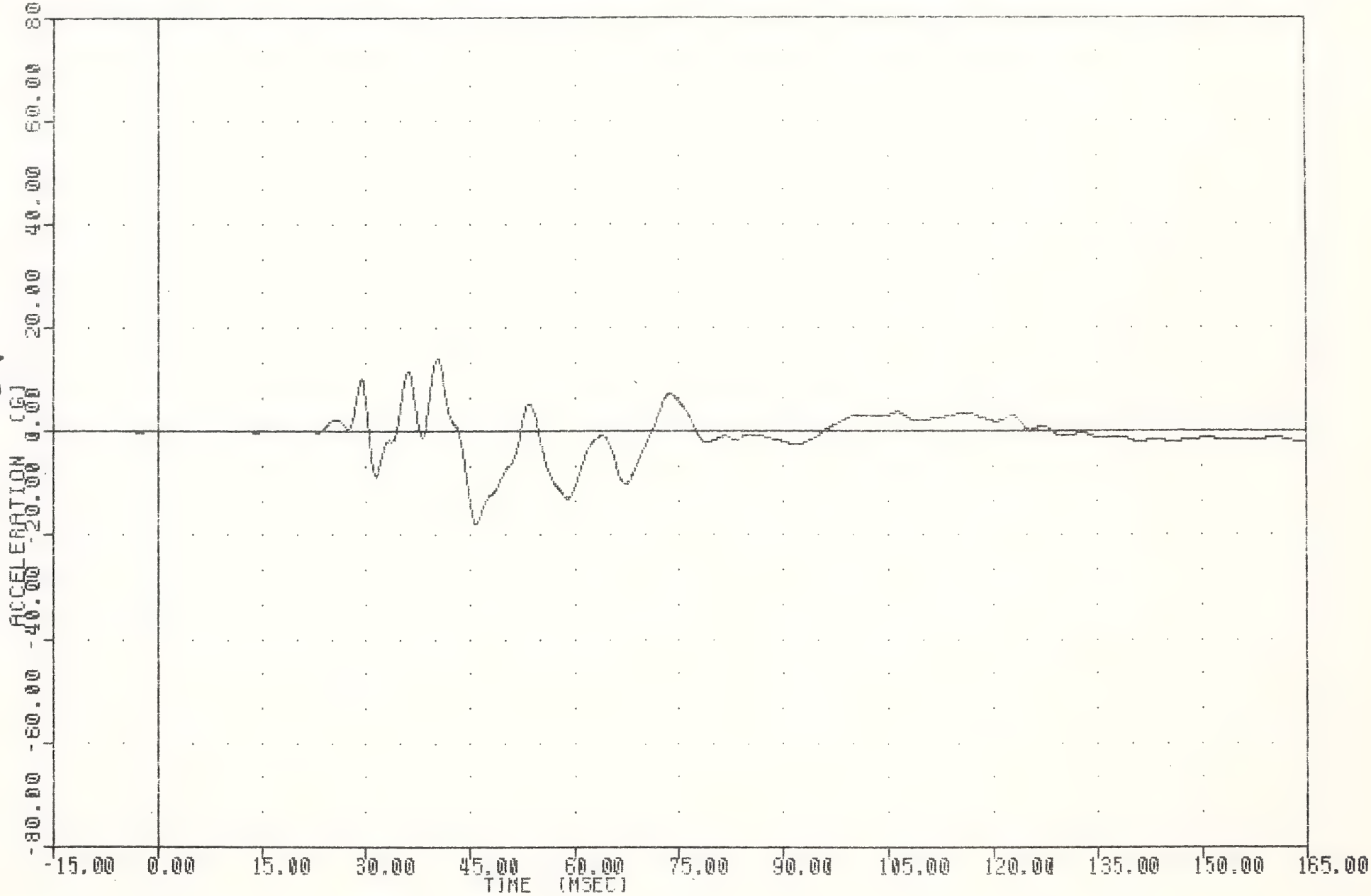
CHEST ACCELERATION X AXIS PASSENGER

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 300/ 950/ -40
CSTYG2 MIN. MAX VALUES = -20.83 @ 50.13 , 23.44 @ 59.38



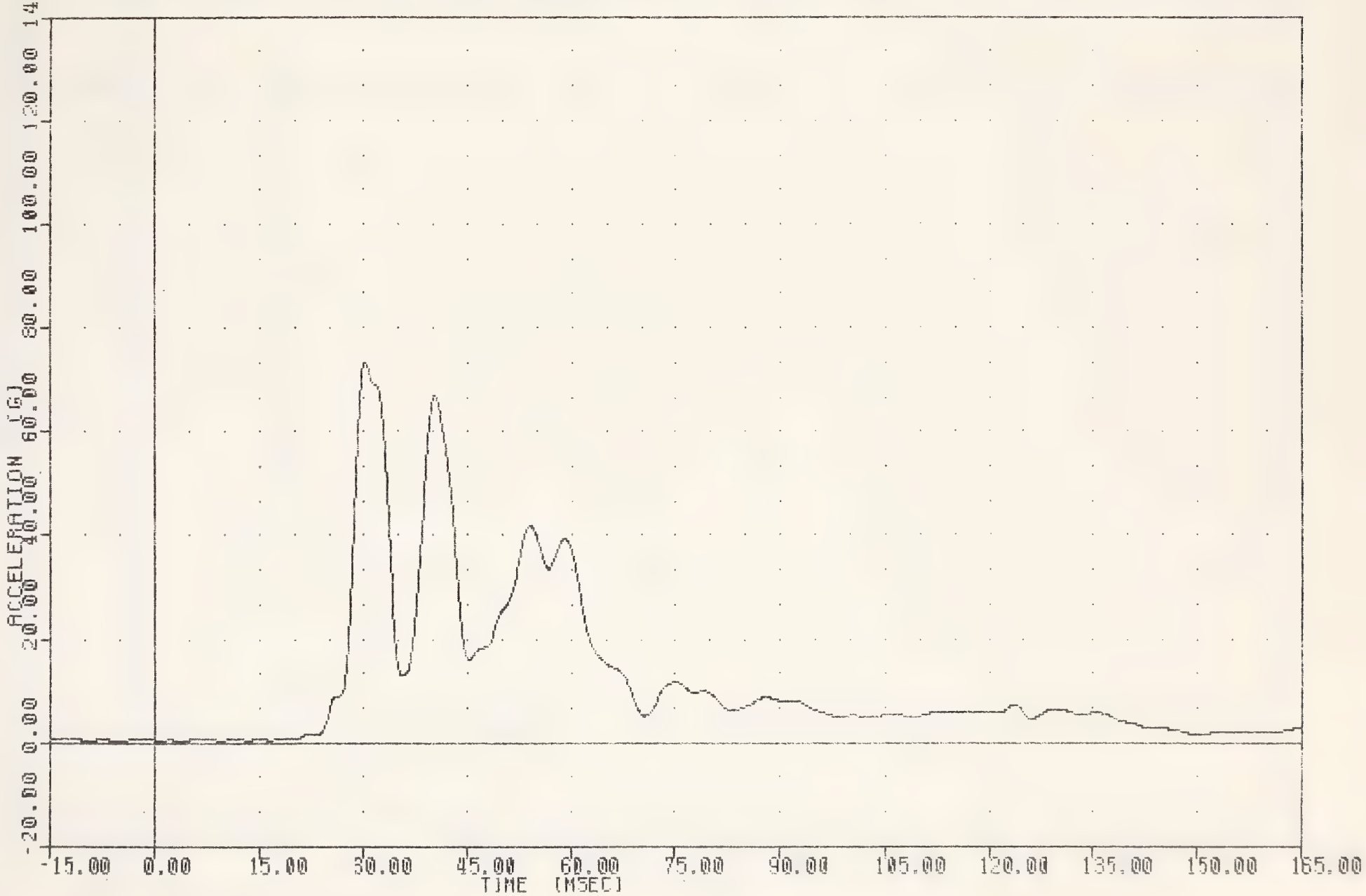
CHEST ACCELERATION Y AXIS PASSENGER

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 300/ 950/ -40
CSTZG2 MIN. MAX VALUES = -17.84 @ 45.83 , 14.12 @ 40.13



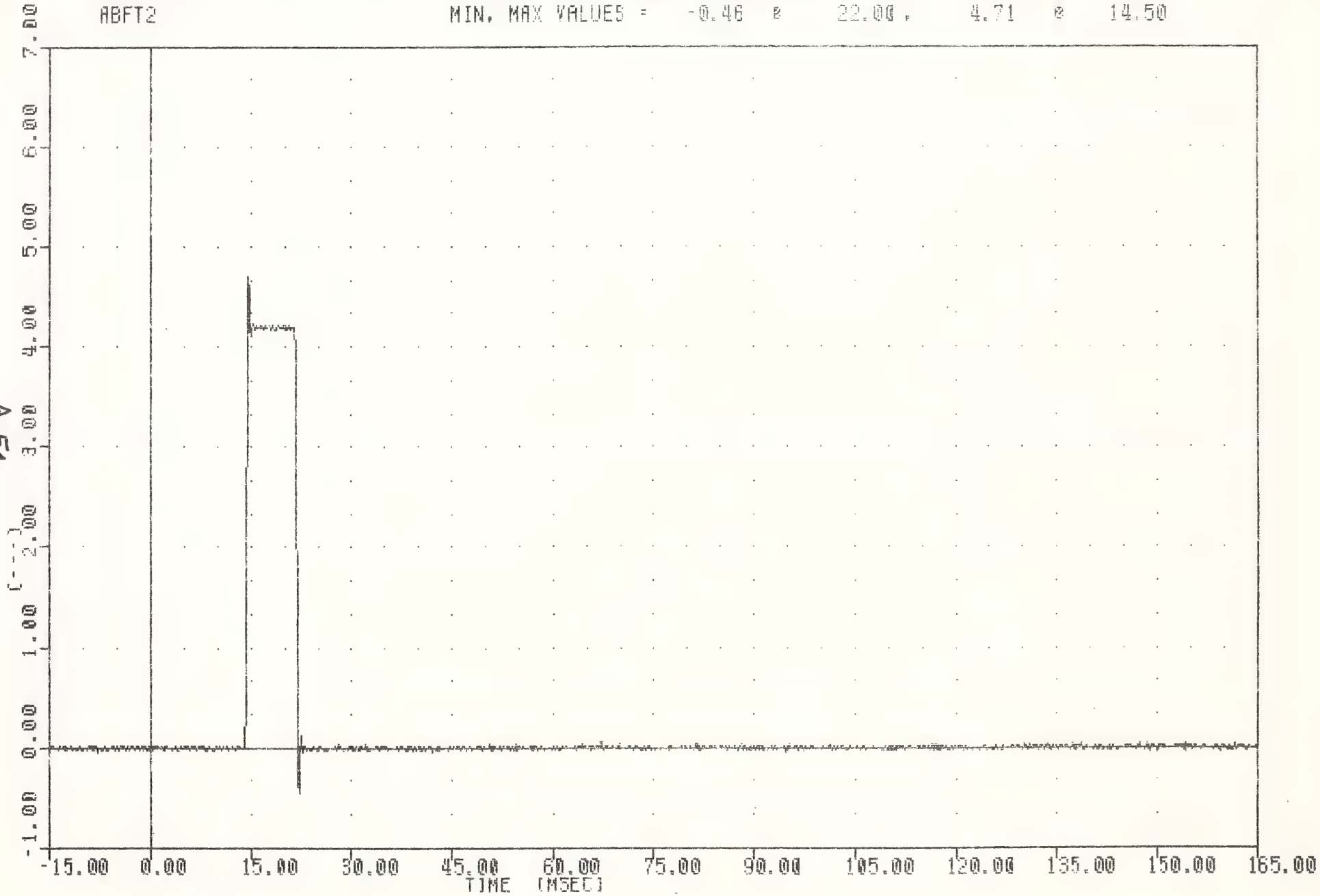
CHEST ACCELERATION Z AXIS PASSENGER

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 300/ 950/ -40
CSTRG2 MIN. MAX VALUES = 0.38 @ 3.75 , 73.43 @ 30.00

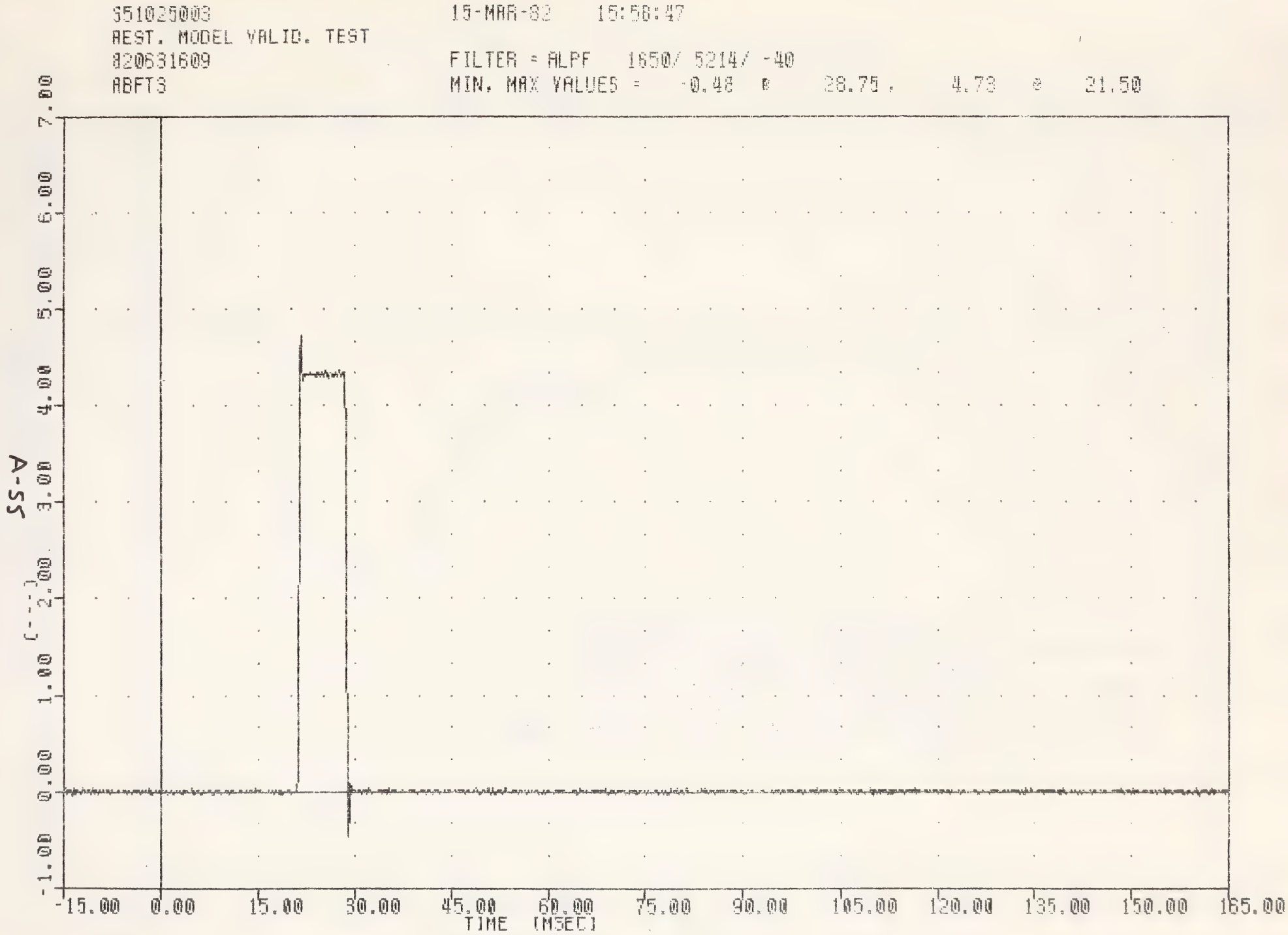


PASS CHEST RESULTANT

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = ALPF 1650/ 5214/ -40
ABFT2 MIN, MAX VALUES = -0.46 @ 22.00 , 4.71 @ 14.50

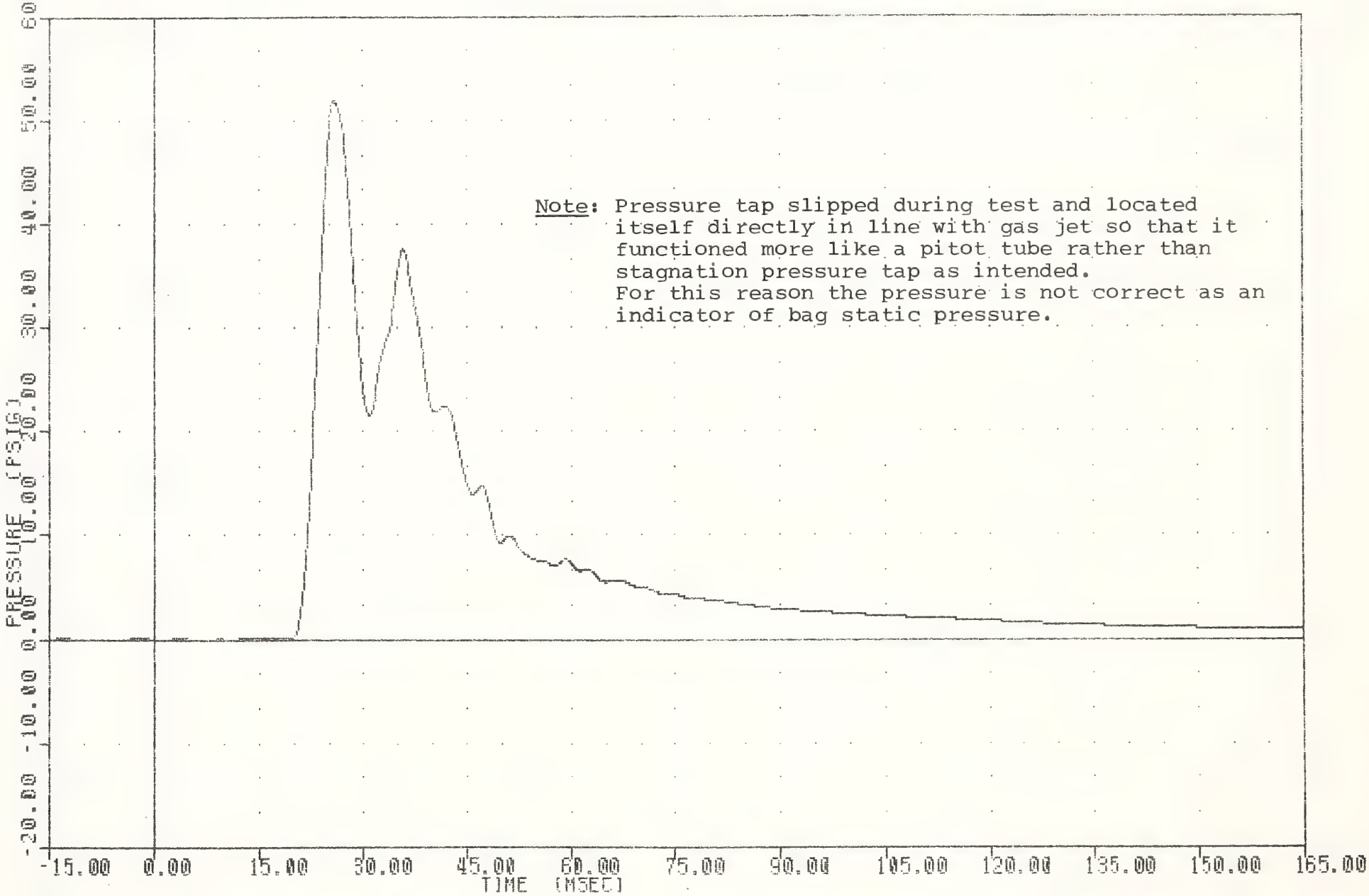


AIR BAG FIRING EVENT PASSENGER



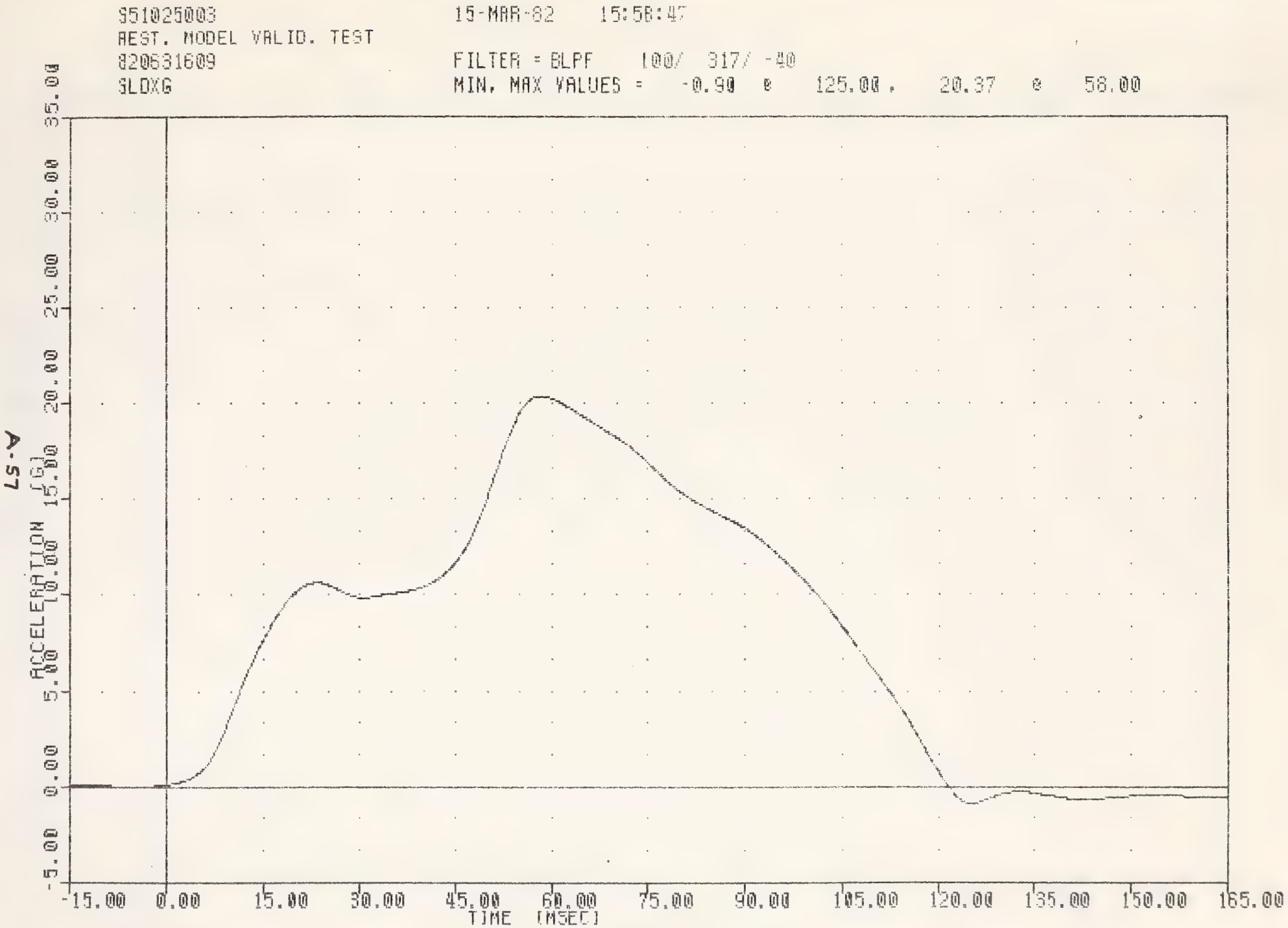
AIR BAG FIRING EVENT 3

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 300/ 350/ -40
ABP2 MIN, MAX VALUES = -0.02 @ -10.63 , 51.84 @ 25.75



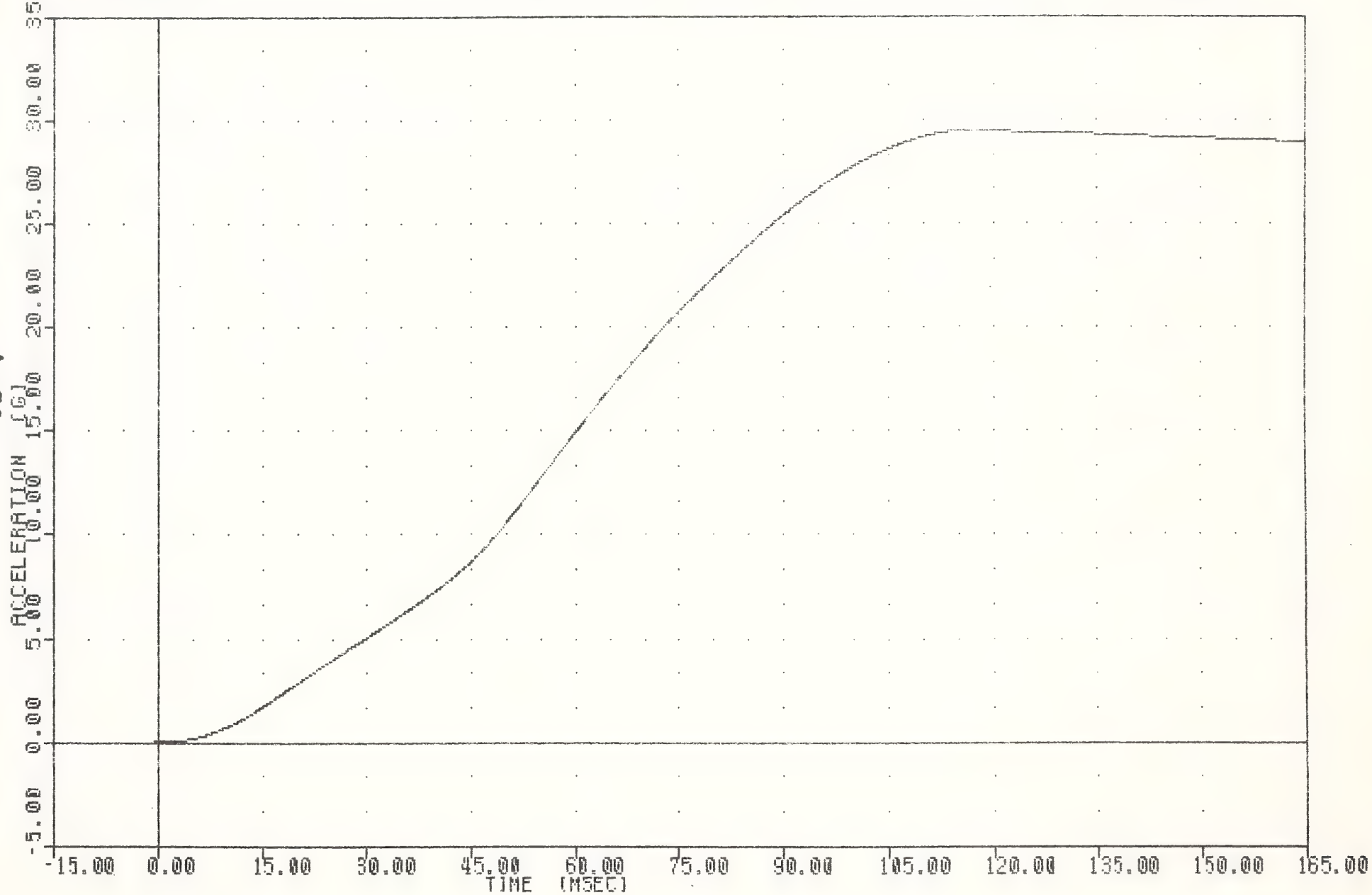
Note: Pressure tap slipped during test and located itself directly in line with gas jet so that it functioned more like a pitot tube rather than stagnation pressure tap as intended.
For this reason the pressure is not correct as an indicator of bag static pressure.

AIR BAG PRESSURE PASSENGER



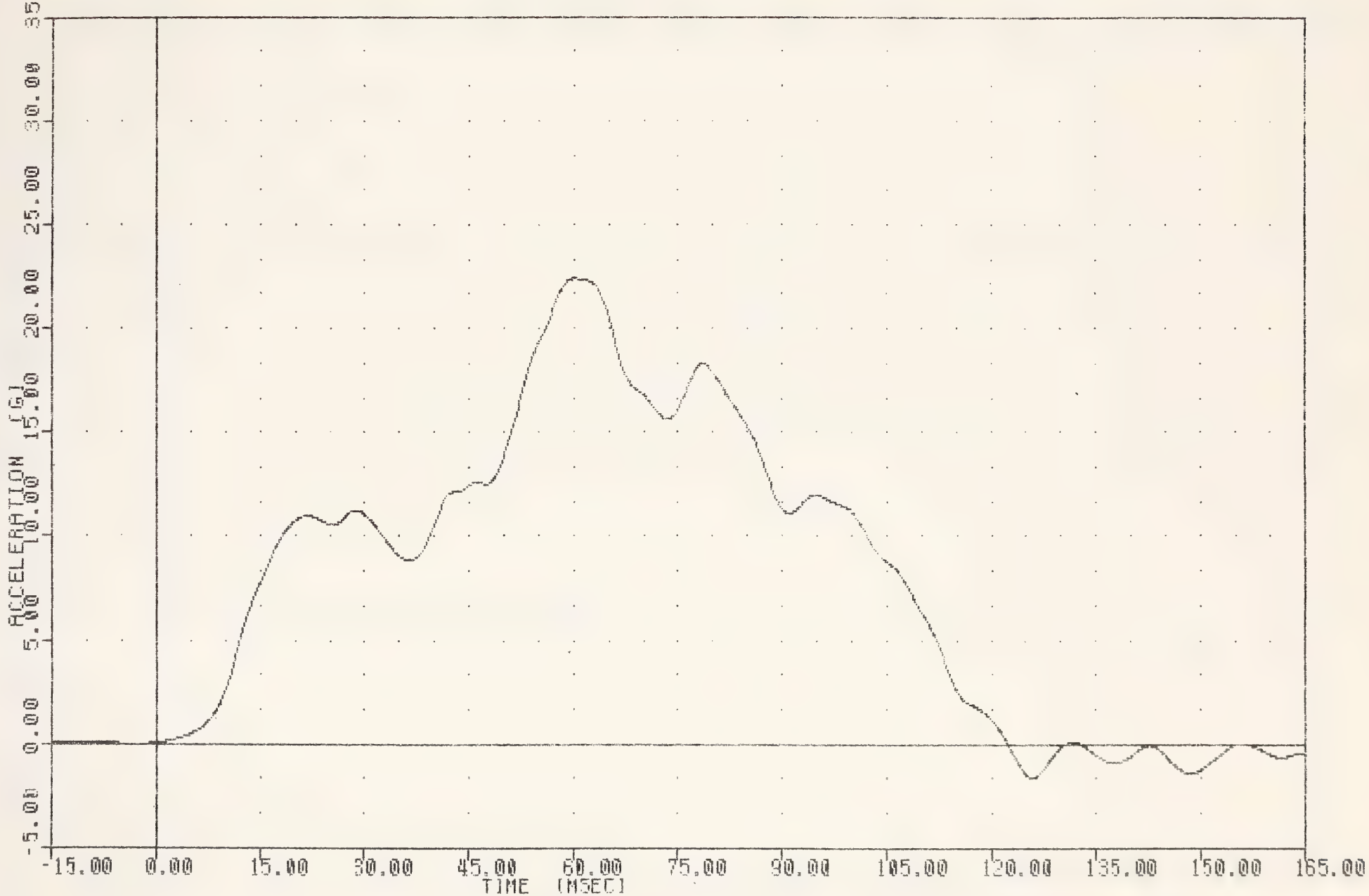
SLED ACCELERATION

S51025003 16-MAR-82 09:04:49
REST. MODEL VALID. TEST
820631609 FILTER = ALPF 1650/ 5214/ -40
SLDXV2 MIN, MAX VALUES = -0.03 @ -5.88 , 29.47 @ 118.00

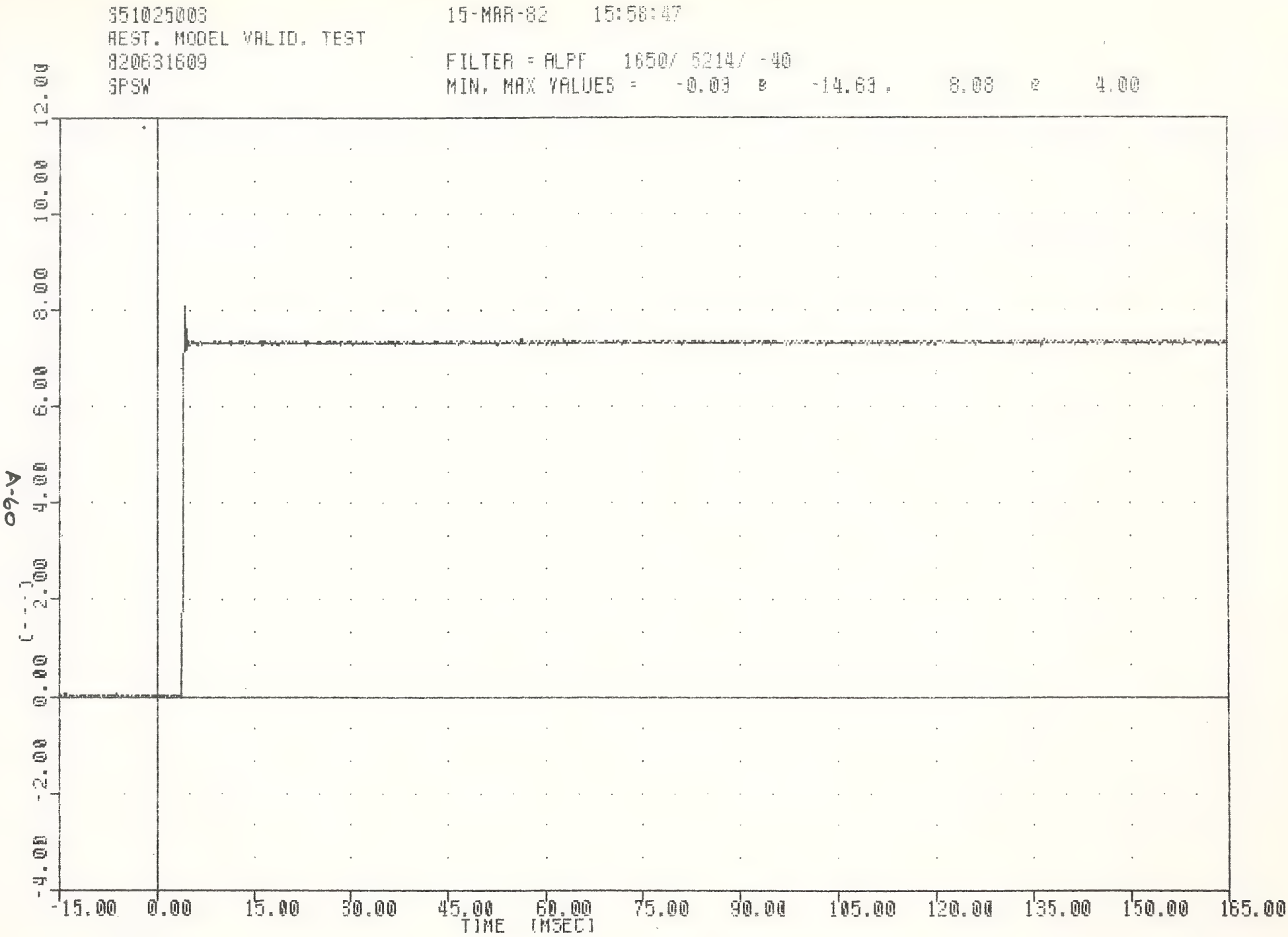


INTEGRATED SLED VELOCITY

S51025003 15-MAR-82 15:58:47
REST. MODEL VALID. TEST
820631609 FILTER = BLPF 100/ 317/ -40
FTUXG MIN. MAX VALUES = -1.64 @ 125.75 , 22.40 @ 60.00

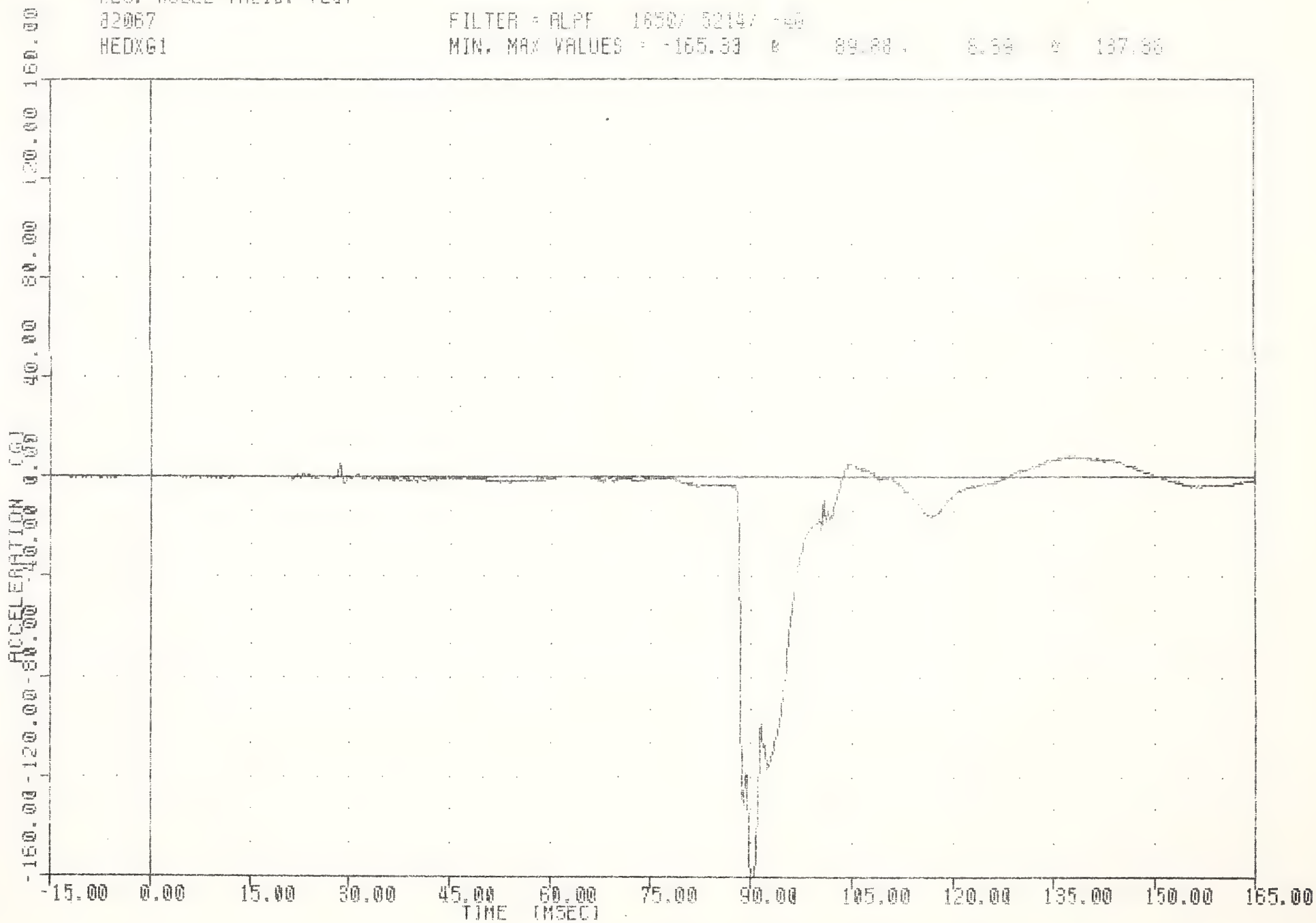


FLOOR PAN TUNNEL ACCELERATION



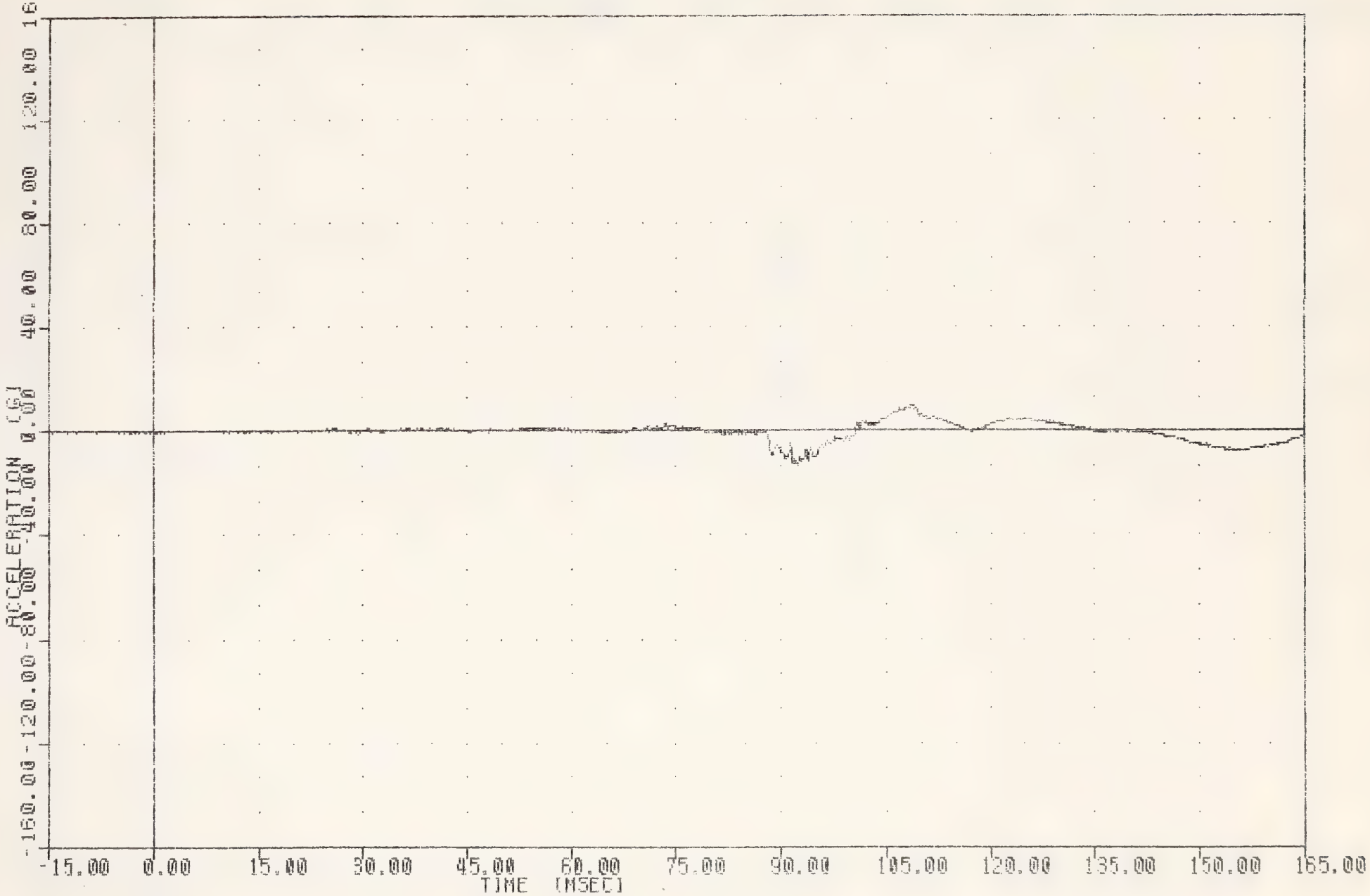
SLED POSITION SWITCH

TEST NO. 3

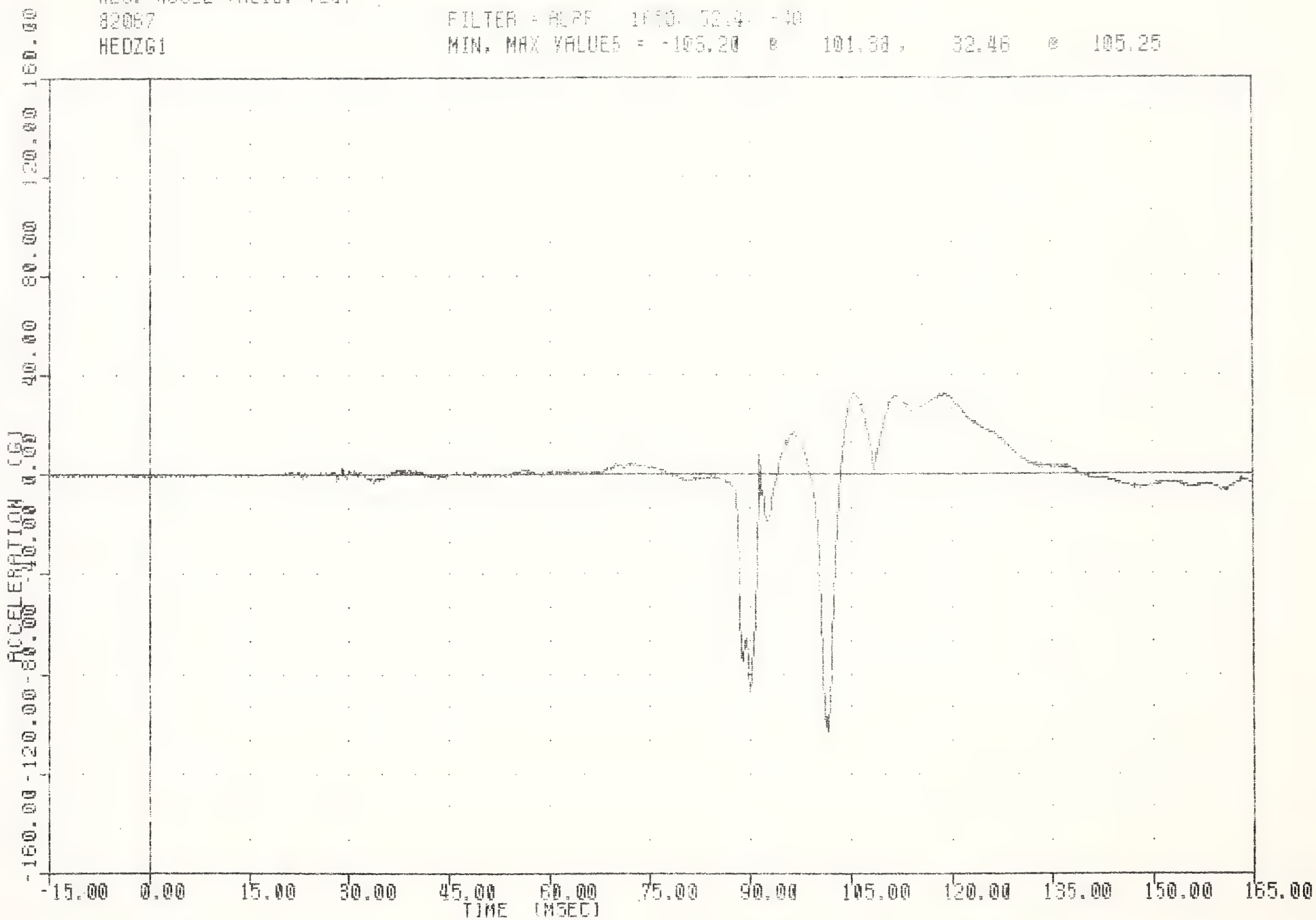


HEAD ACCELERATION X AXIS DRIVER

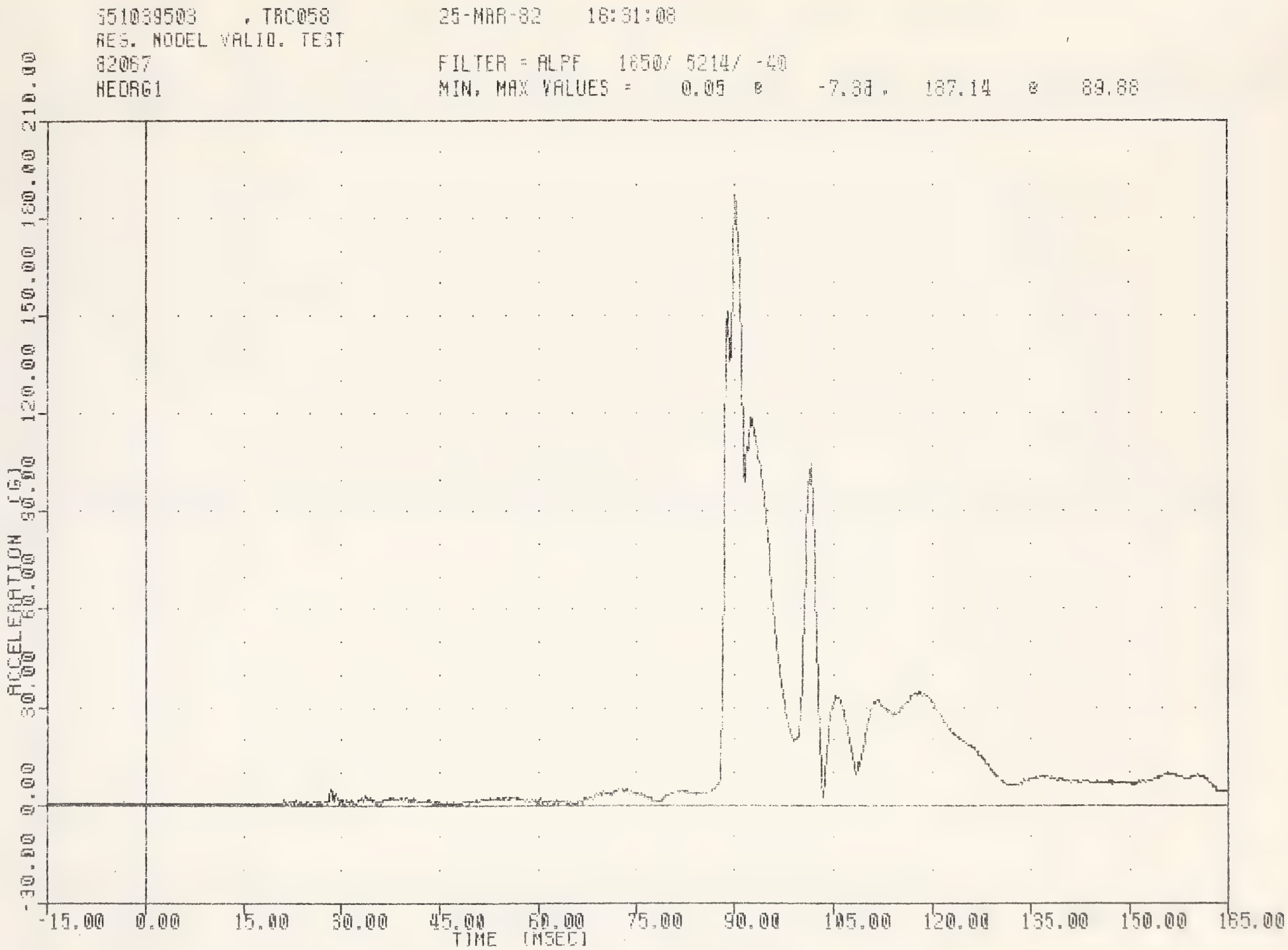
S51039503 , TRC058 25-MAR-82 15:36:50
RES. MODEL VALID. TEST
82067 FILTER = ALPF 1050/ 5214/ 00
HEDYG1 MIN, MAX VALUES = -19.19 @ 92.19 , 9.93 @ 108.75



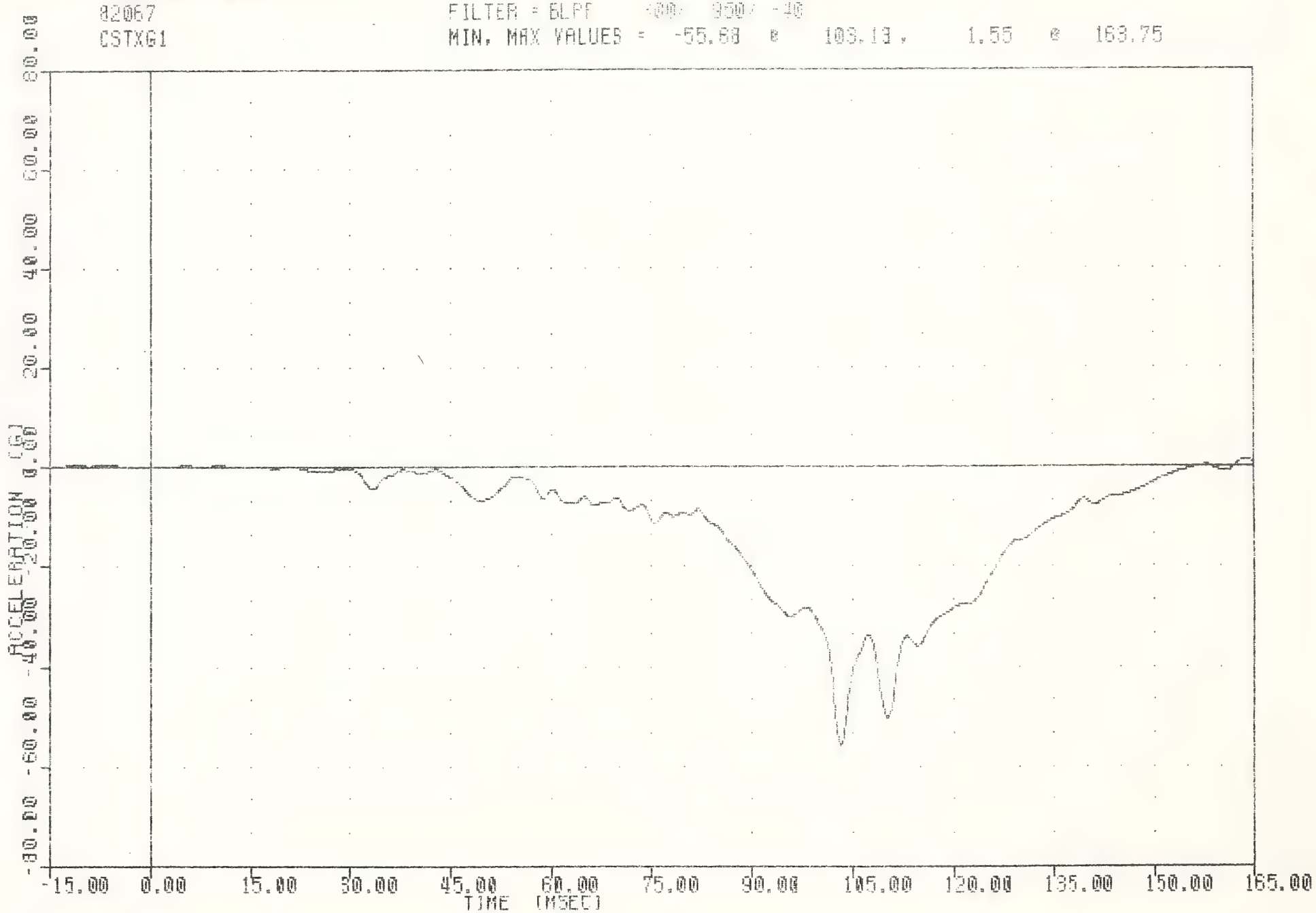
HEAD ACCELERATION Y AXIS DRIVER



HEAD ACCELERATION Z AXIS DRIVER

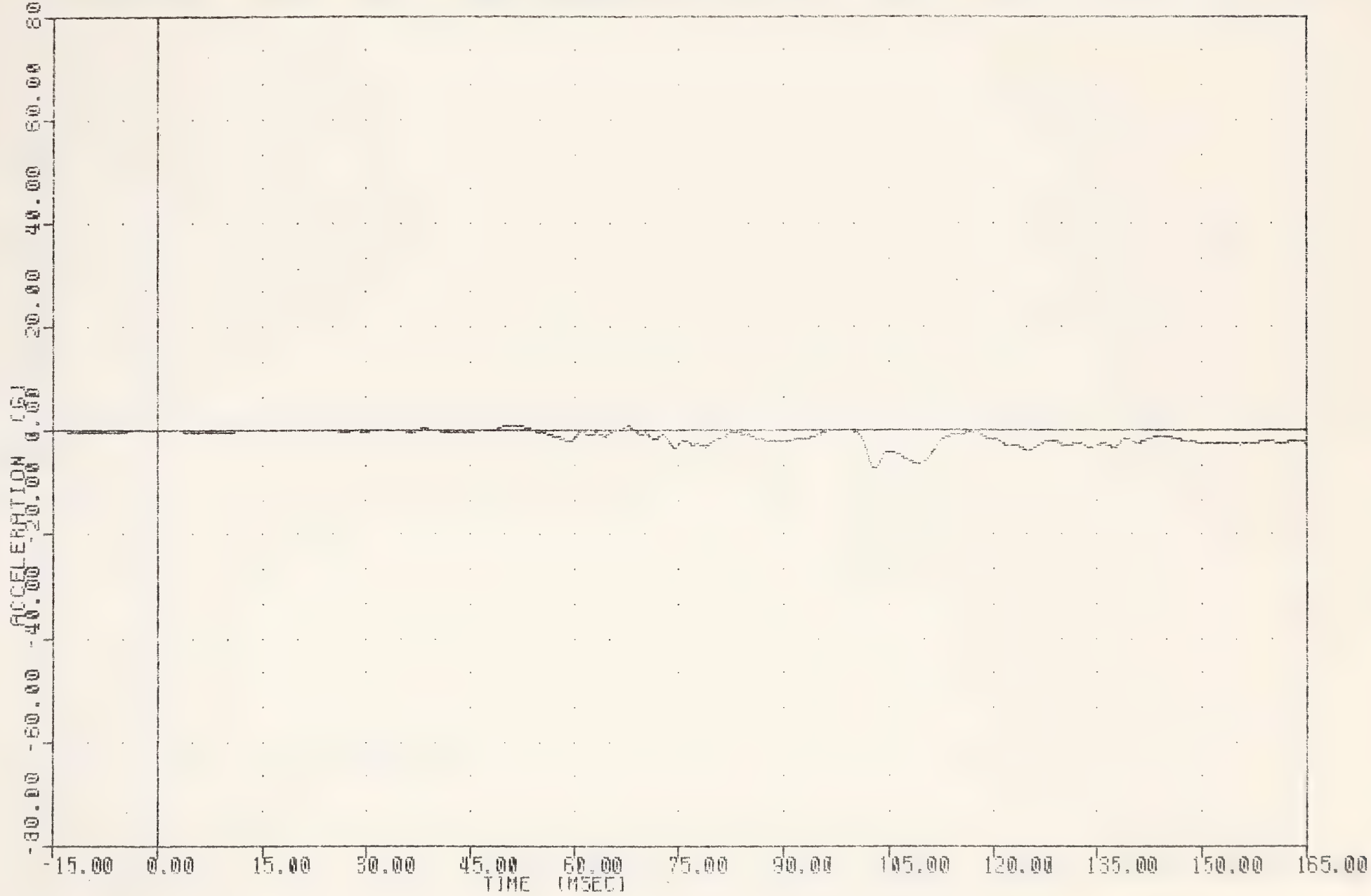


HEAD ACCELERATION RESULTANT DRIVER



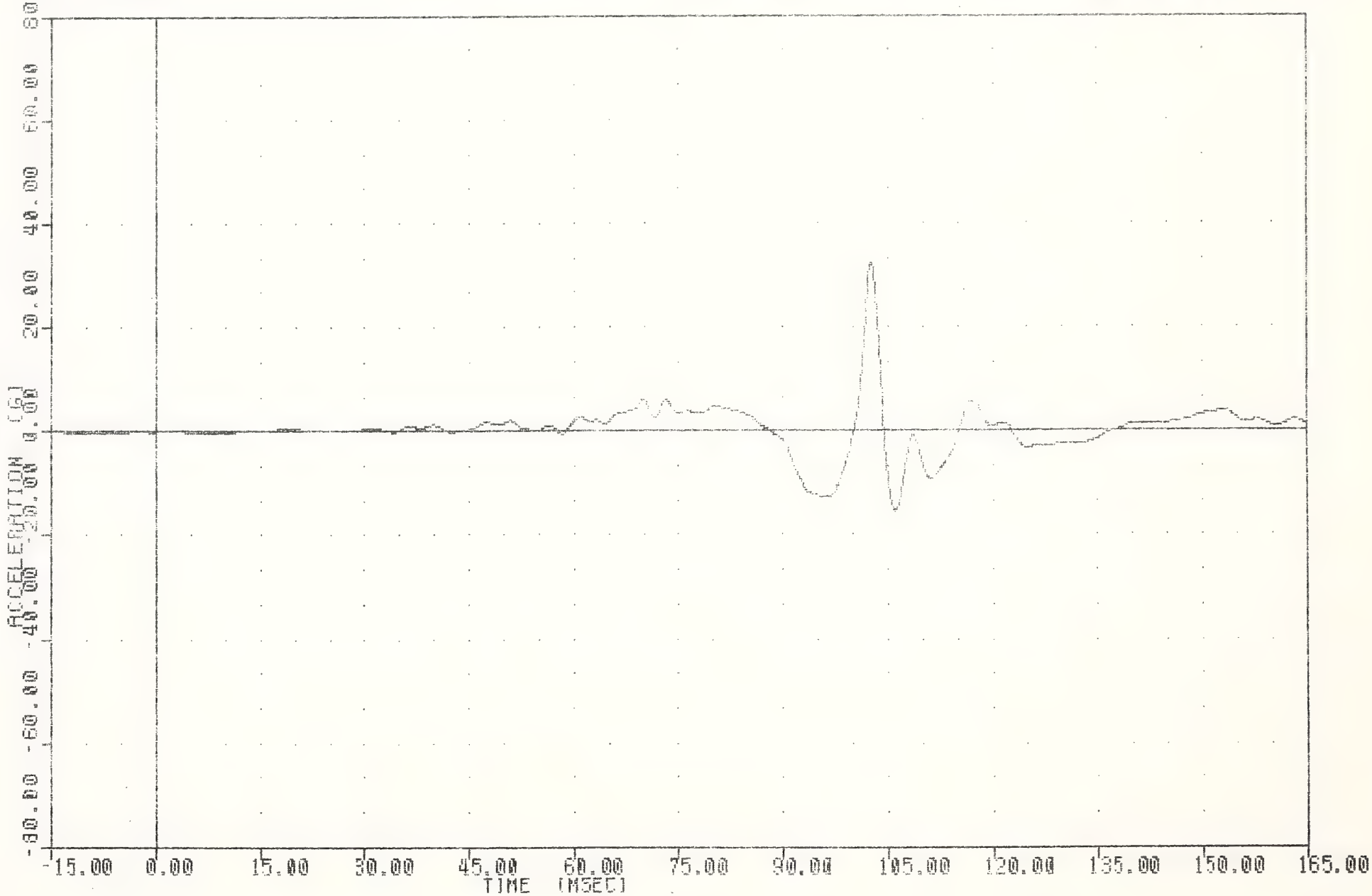
CHEST ACCELERATION X AXIS DRIVER

S51039503 , TRC058 25-MAR-82 15:38:50
AES. MODEL VALID. TEST
82067 FILTER = BLPF 50%, 950/ 40
CSTYG1 MIN. MAX VALUES = -7.24 @ 102.88 , 0.97 @ 67.63

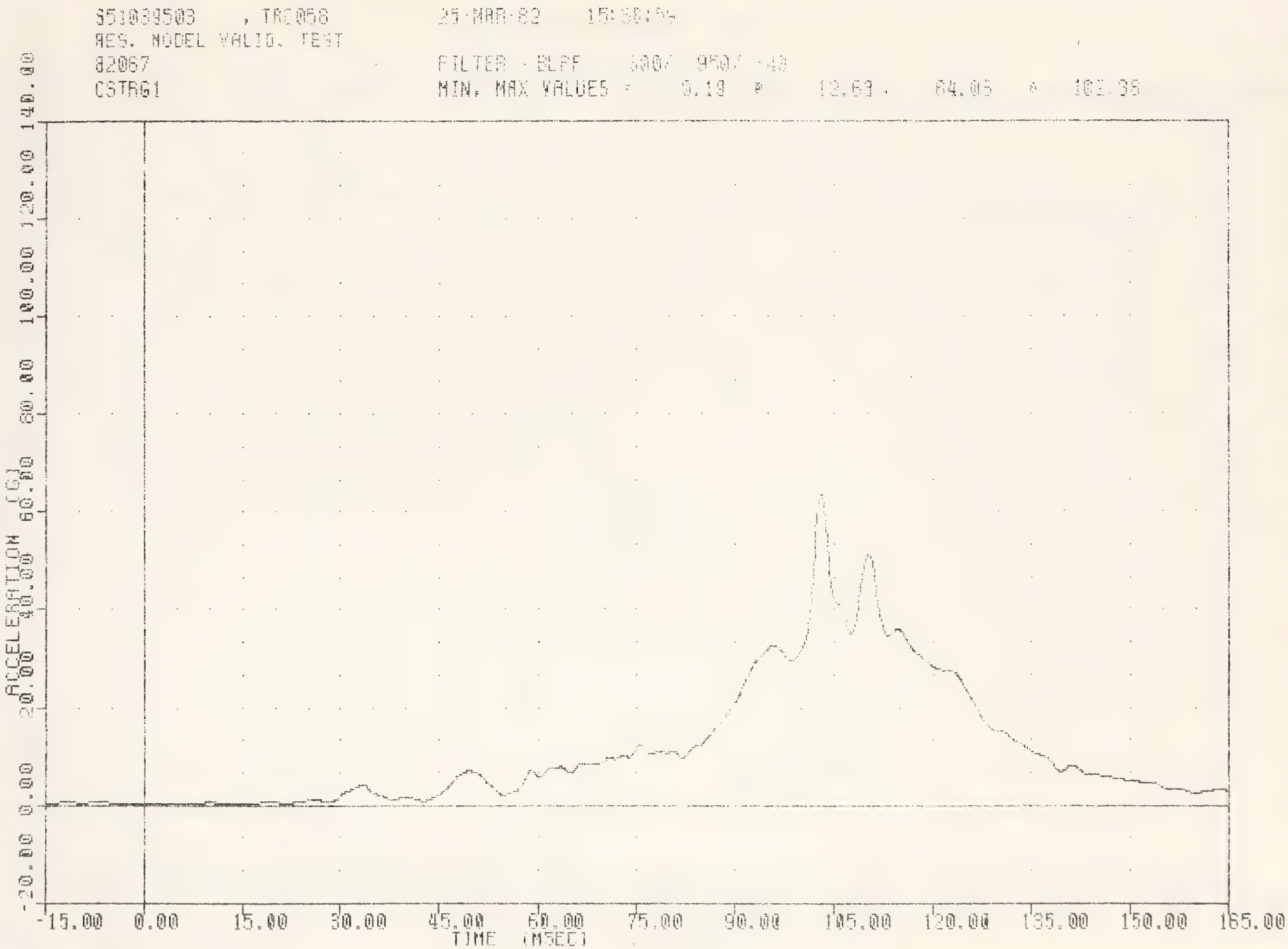


CHEST ACCELERATION Y AXIS DRIVER

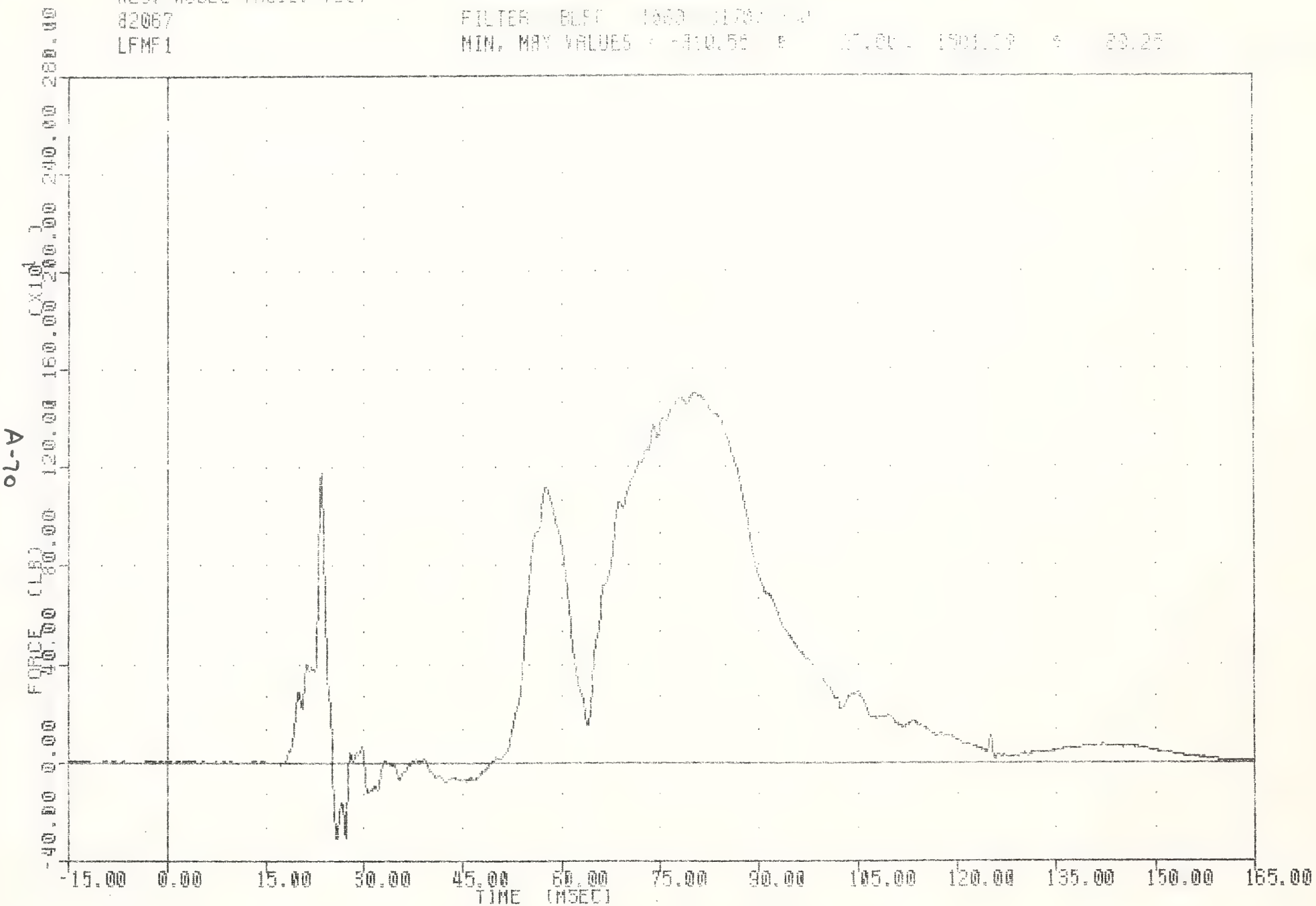
S51039503 , TAC058 25-MAR-82 15:36:59
AES. MODEL VALID. TEST
82067 FILTER = BLPF 300 [illegible] -80
CSTZG1 MIN, MAX VALUES = -15.41 @ 105.69 , 83.82 @ 102.50



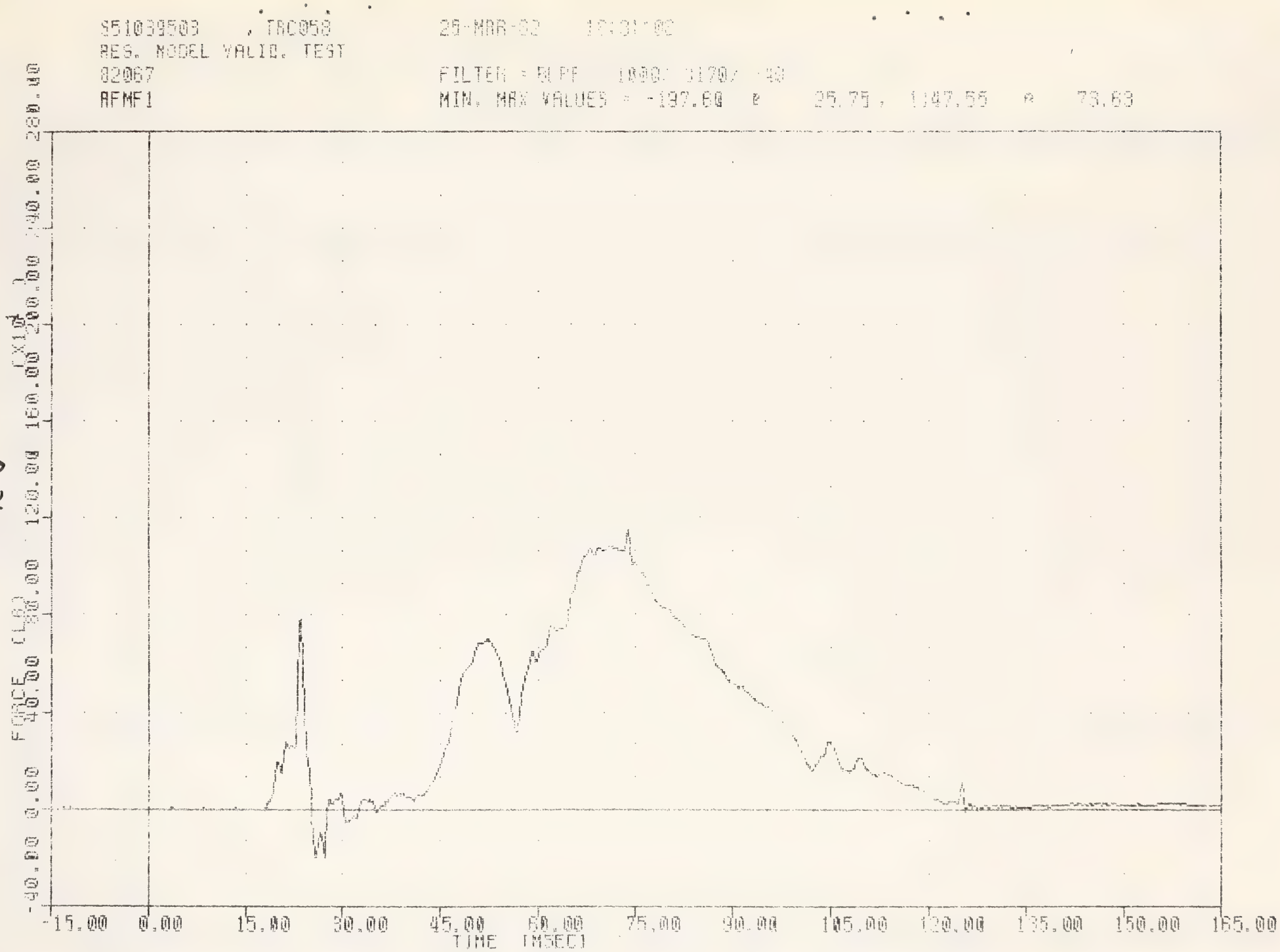
CHEST ACCELERATION Z AXIS DRIVER



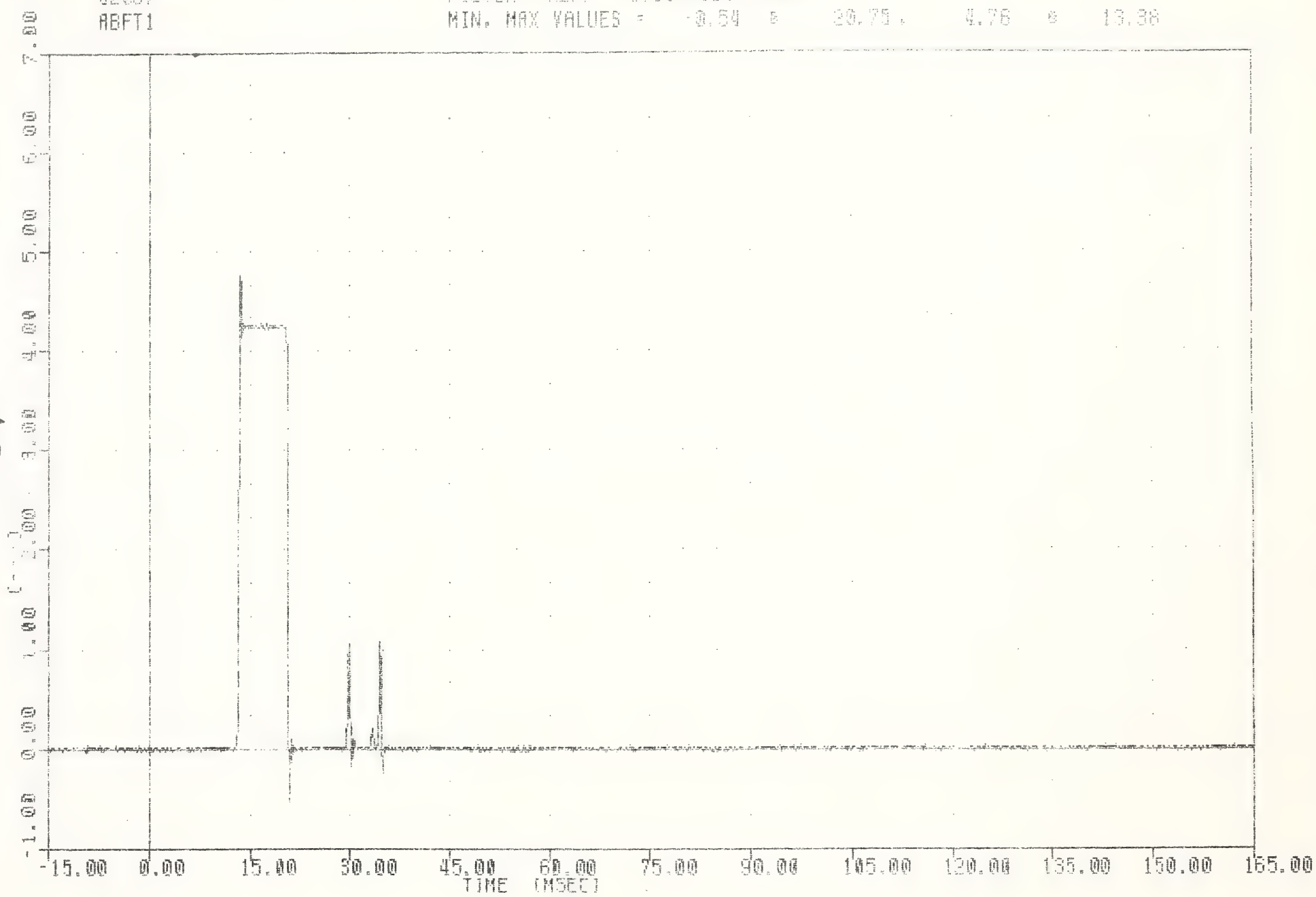
CHEST ACCELERATION RESULTANT DRIVER



LEFT FEMUR FORCE DRIVER

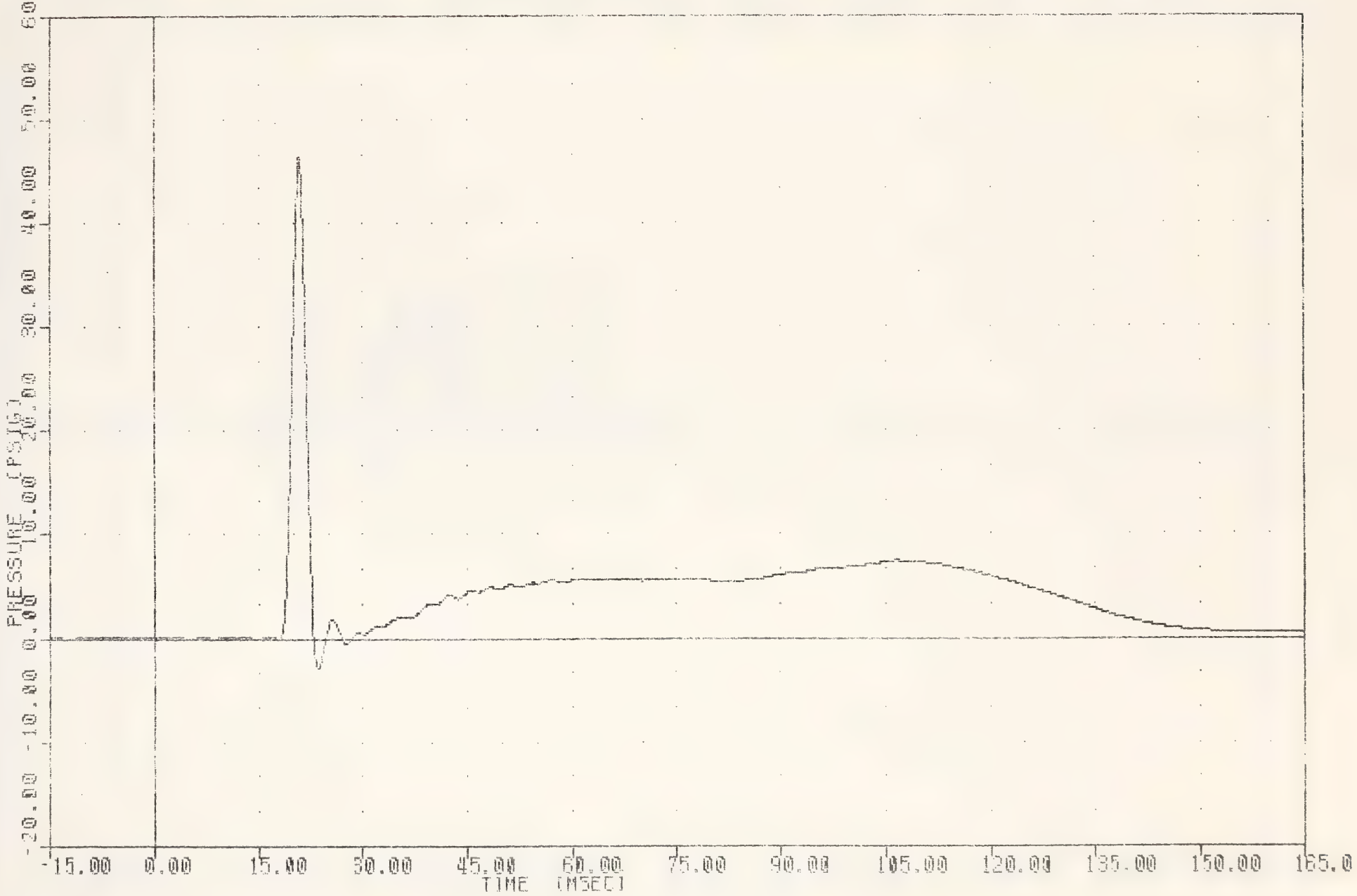


RIGHT FEMUR FORCE DRIVER

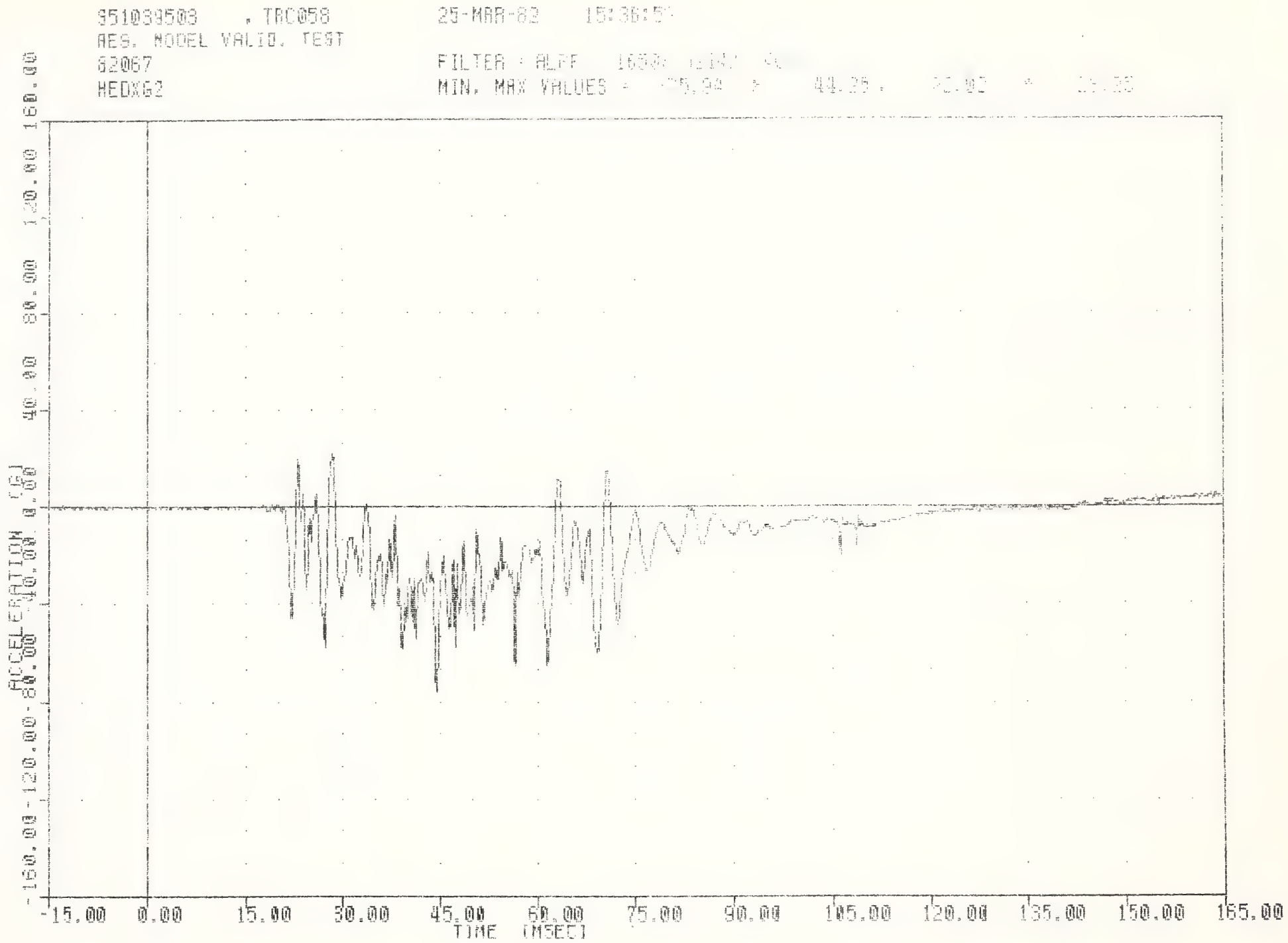


AIR BAG FIRING EVENT DRIVER

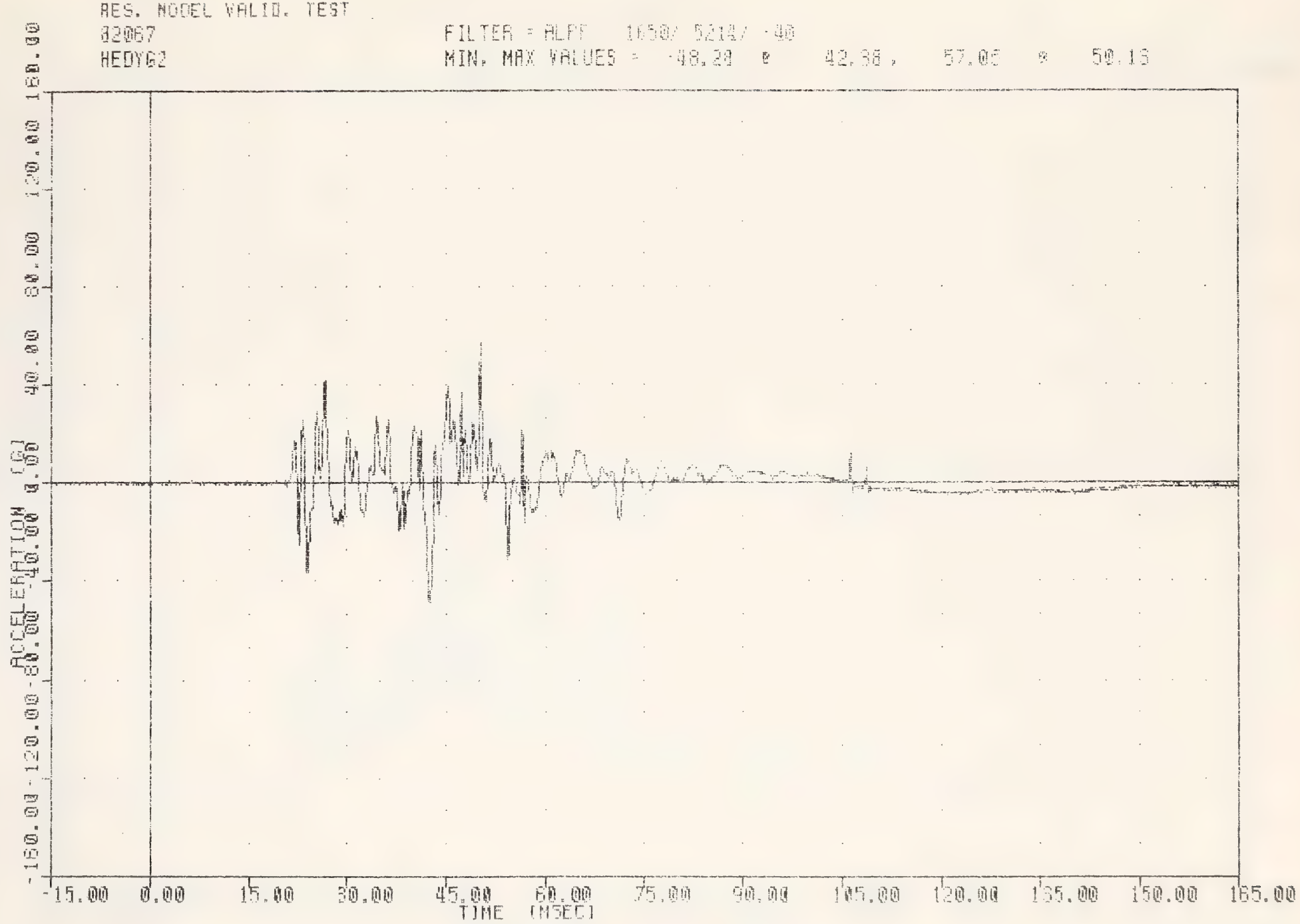
S51039503 . TRC058 26-MAR-82 15:50:56
AES. MODEL VALID. TEST
82067 FILTER = BLPF 300 920 X
ABP1 MIN. MAX VALUES = -2.92 @ 23.50 , 46.32 @ 30.75



AIR BAG PRESSURE DRIVER

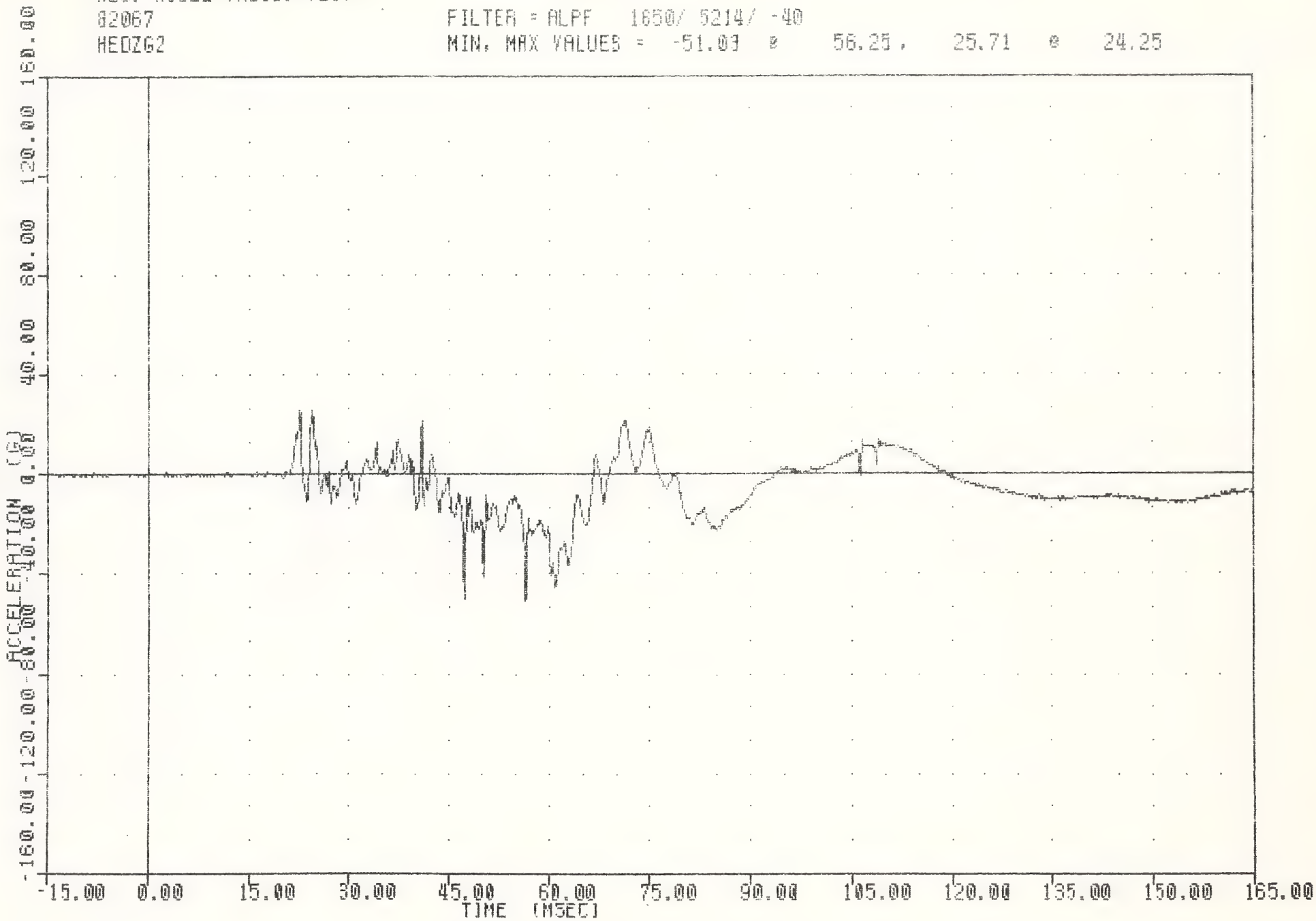


HEAD ACCELERATION X AXIS PASSENGER

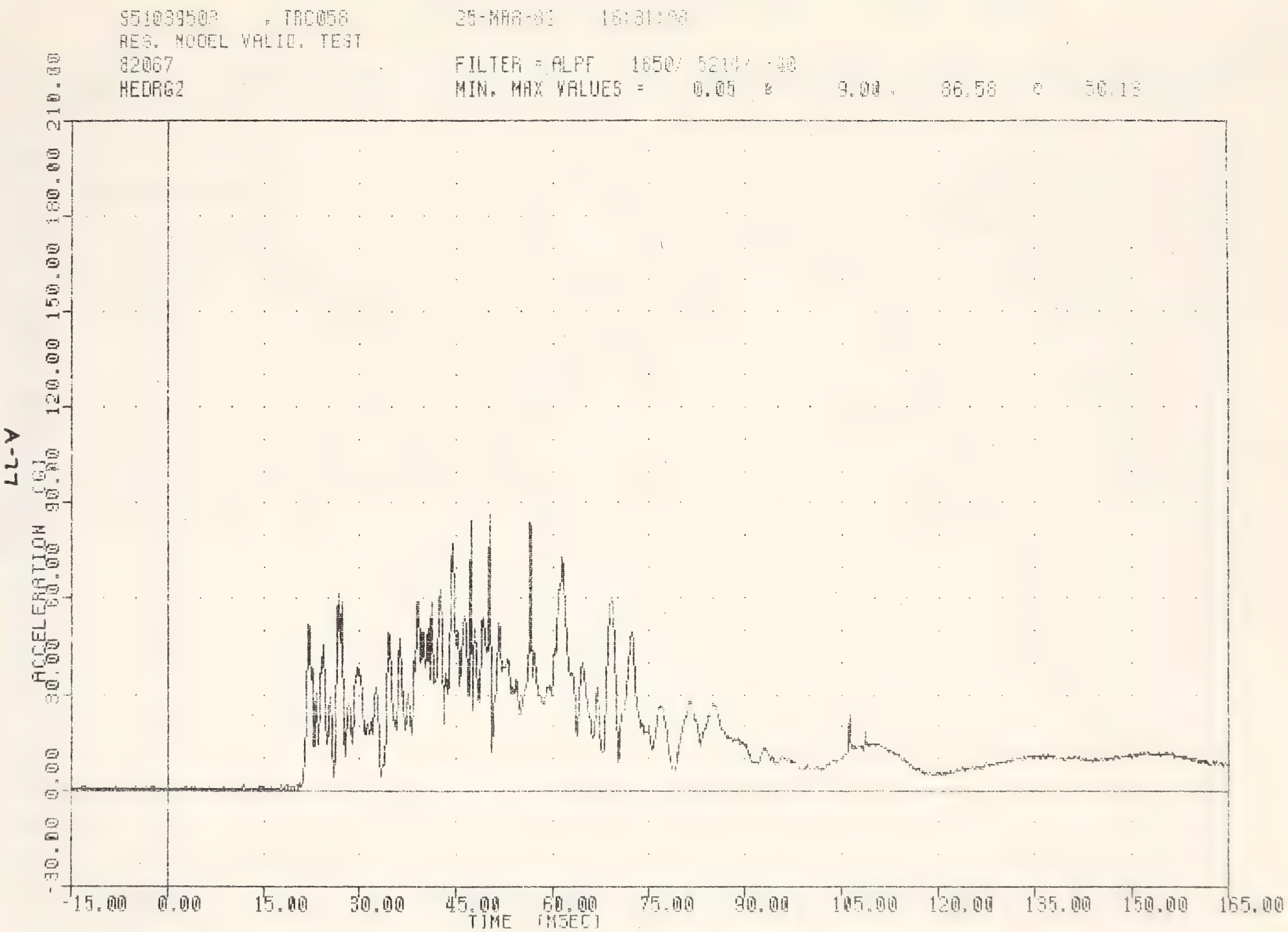


HEAD ACCELERATION Y AXIS PASSENGER

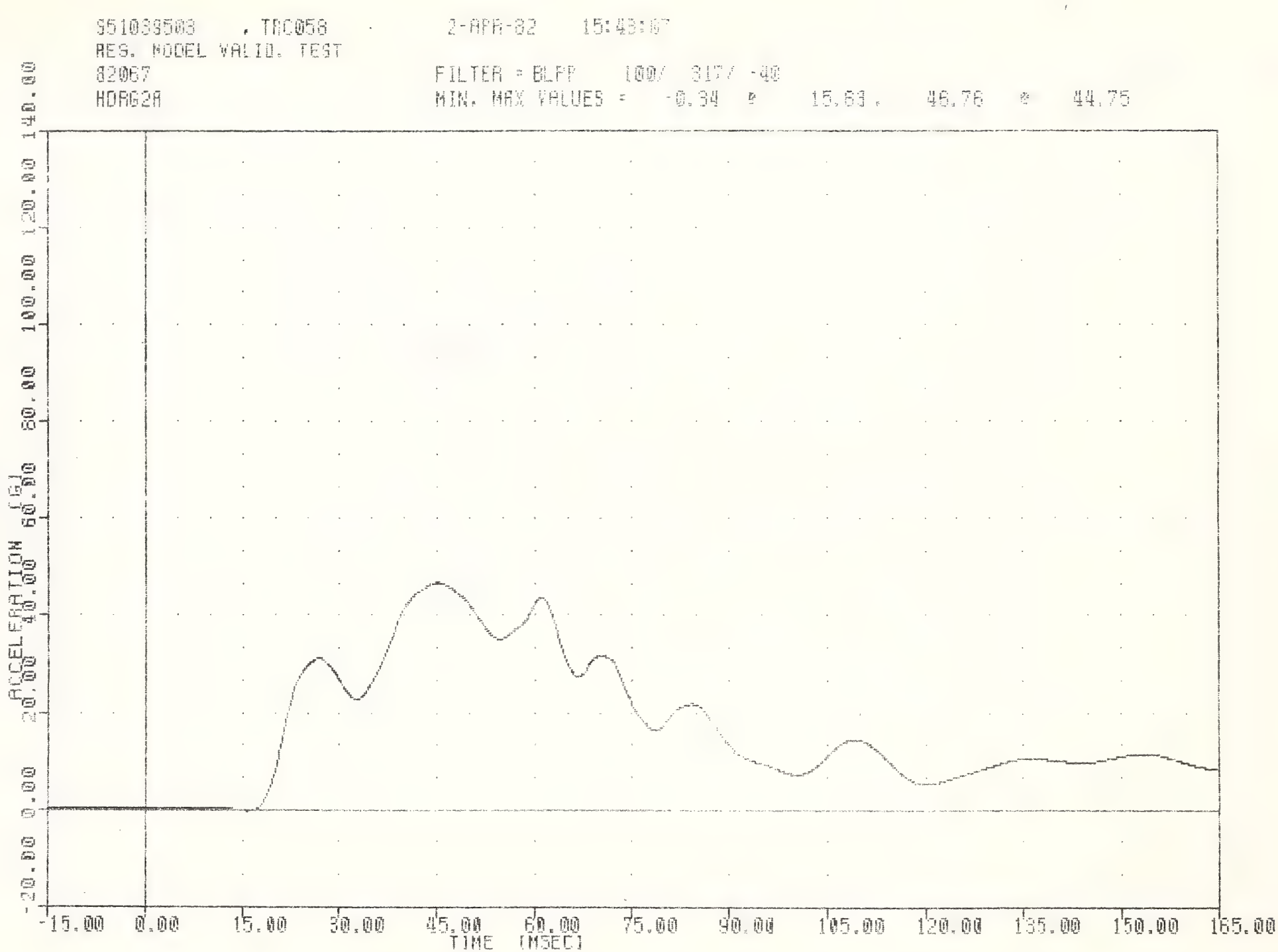
S51039503 . TRC058 25-MAR-82 15:30:59
RES. MODEL VALID. TEST
82067 FILTER = ALPF 1650/ 5214/ -40
HEDZG2 MIN. MAX VALUES = -51.03 @ 56.25 , 25.71 @ 24.25



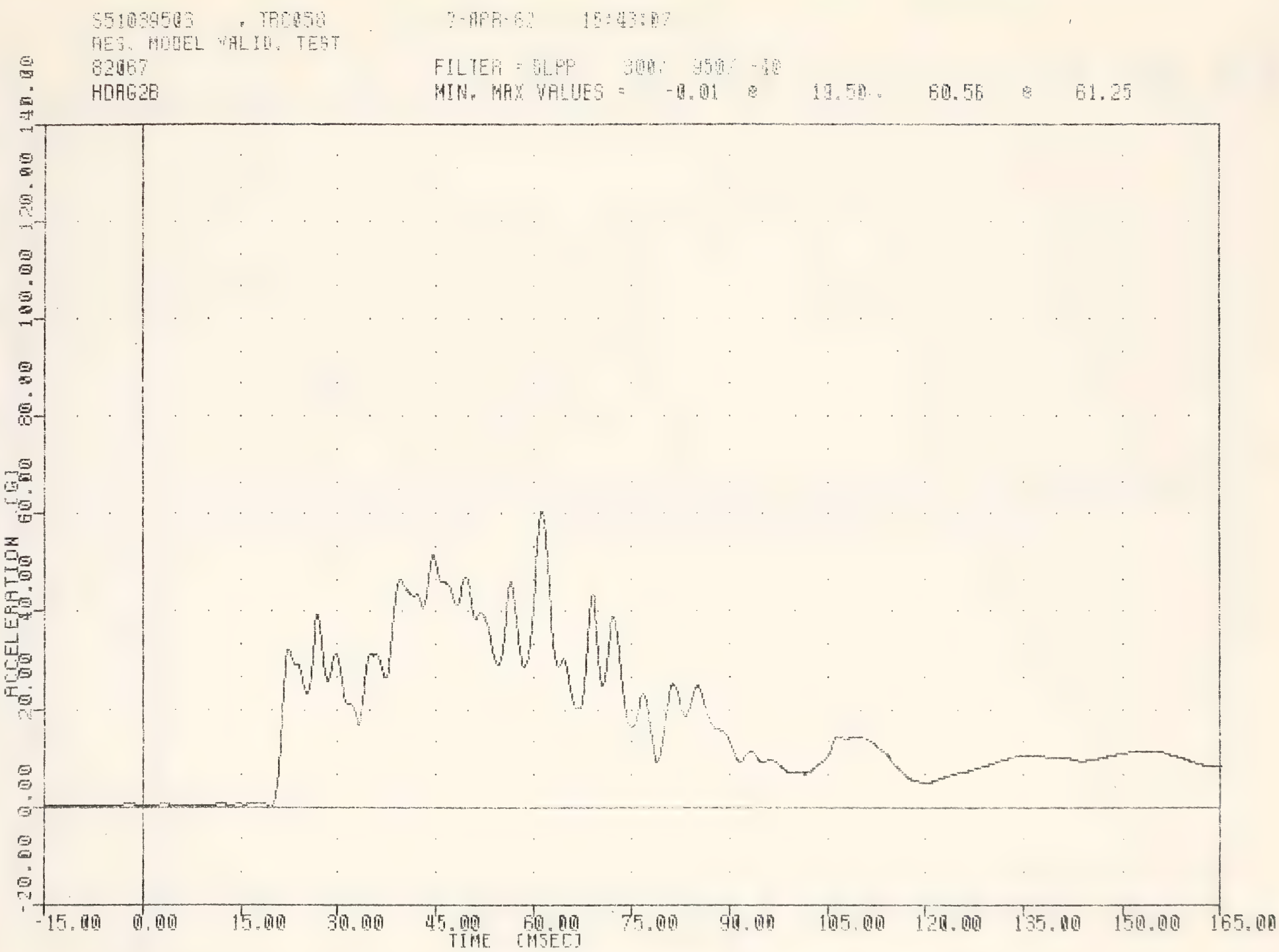
HEAD ACCELERATION Z AXIS PASSENGER



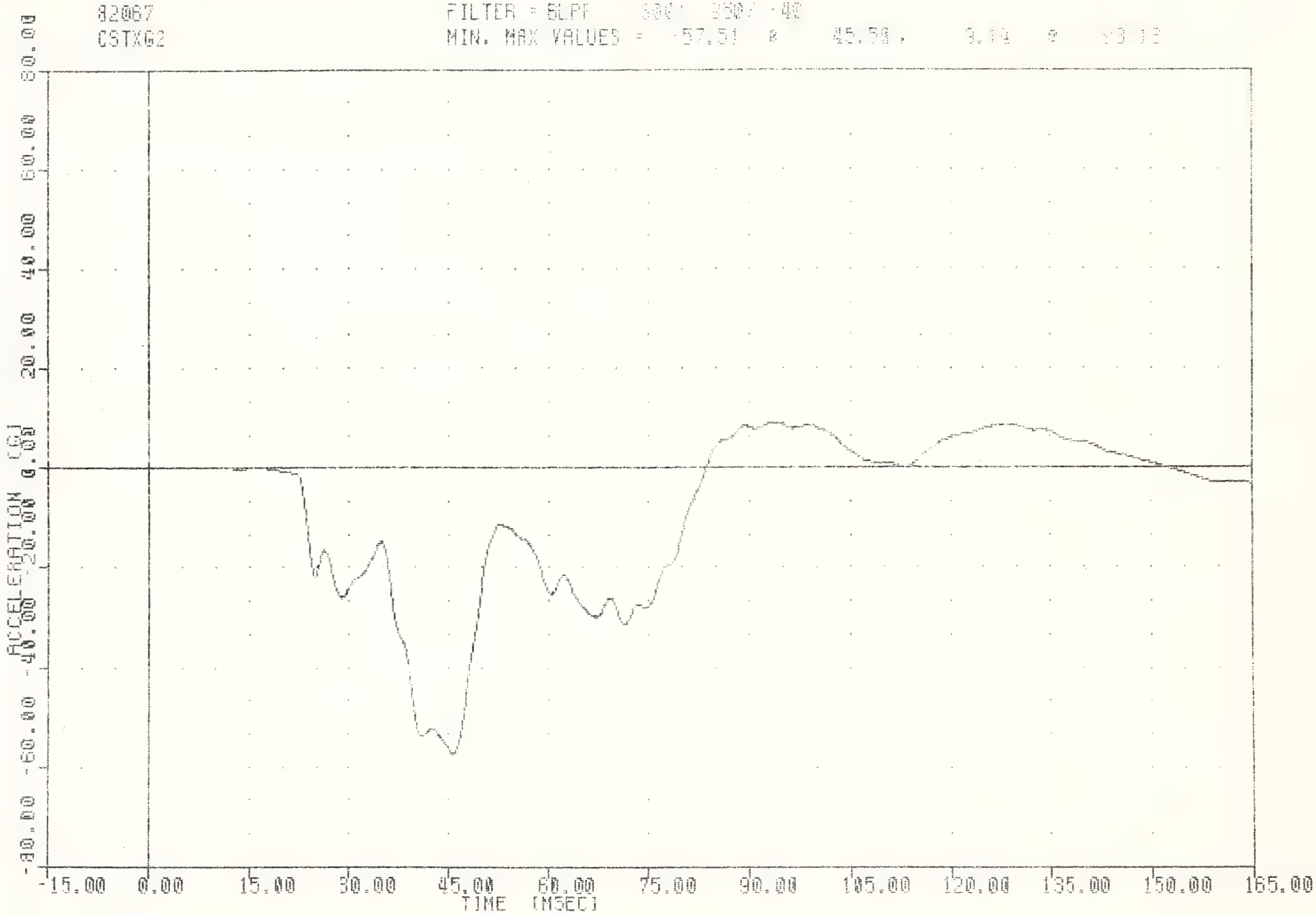
HEAD ACCELERATION RESULTANT PASSENGER



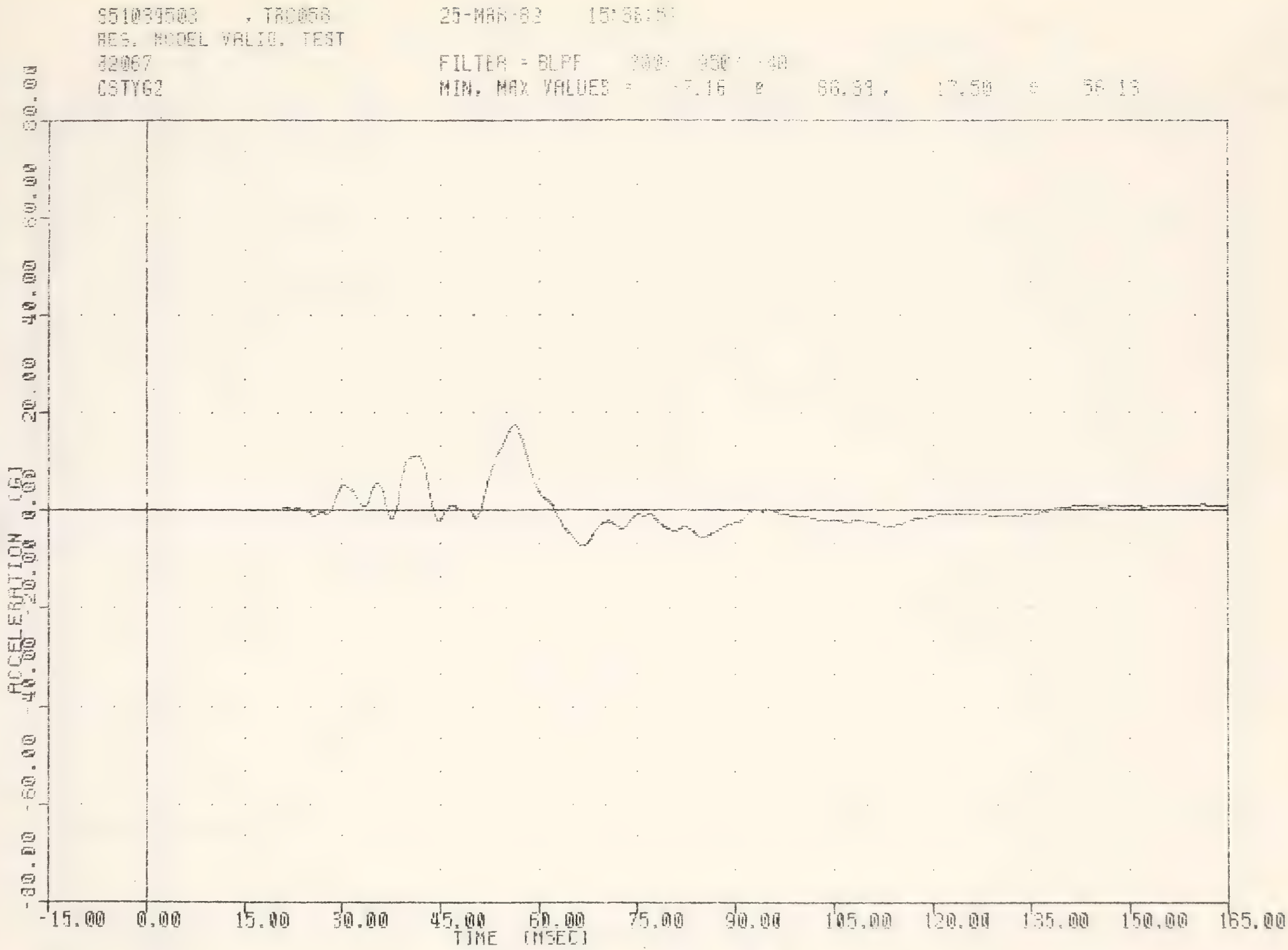
3 YR OLD HEAD RESULTANT [CLASS 100]



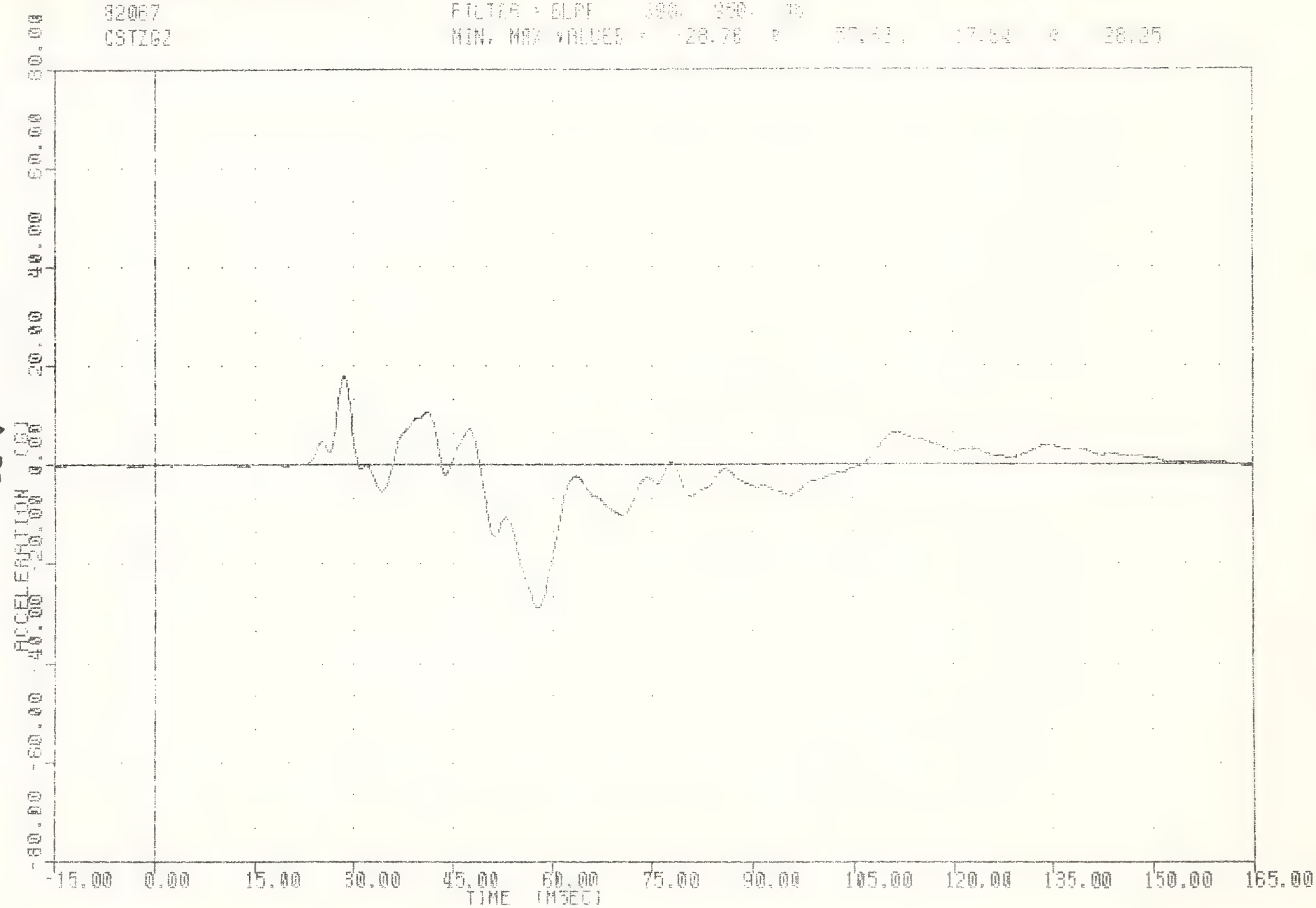
3 YR OLD HEAD RESULTANT (CLASS 180)



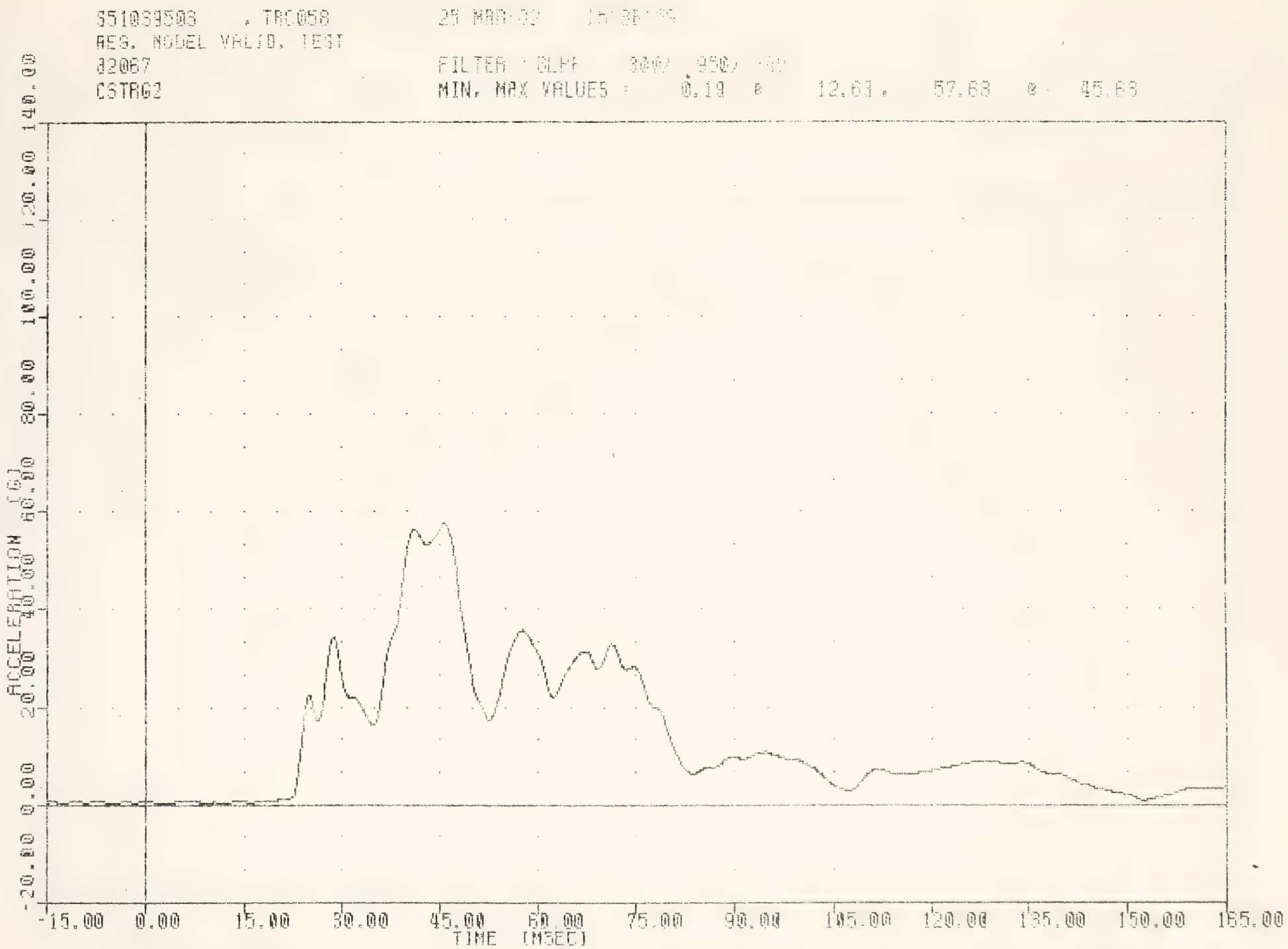
CHEST ACCELERATION X AXIS PASSENGER



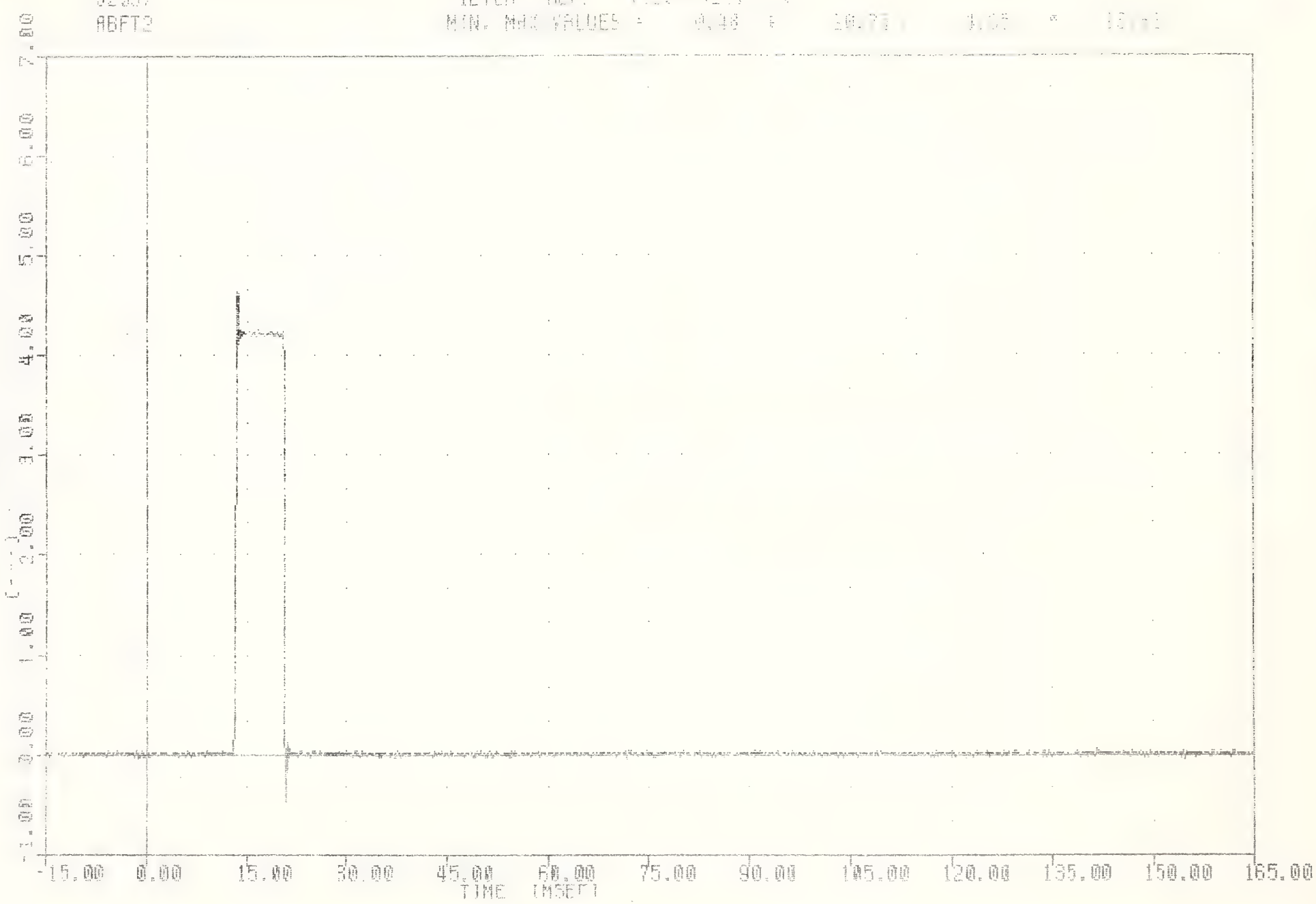
CHEST ACCELERATION Y AXIS PASSENGER



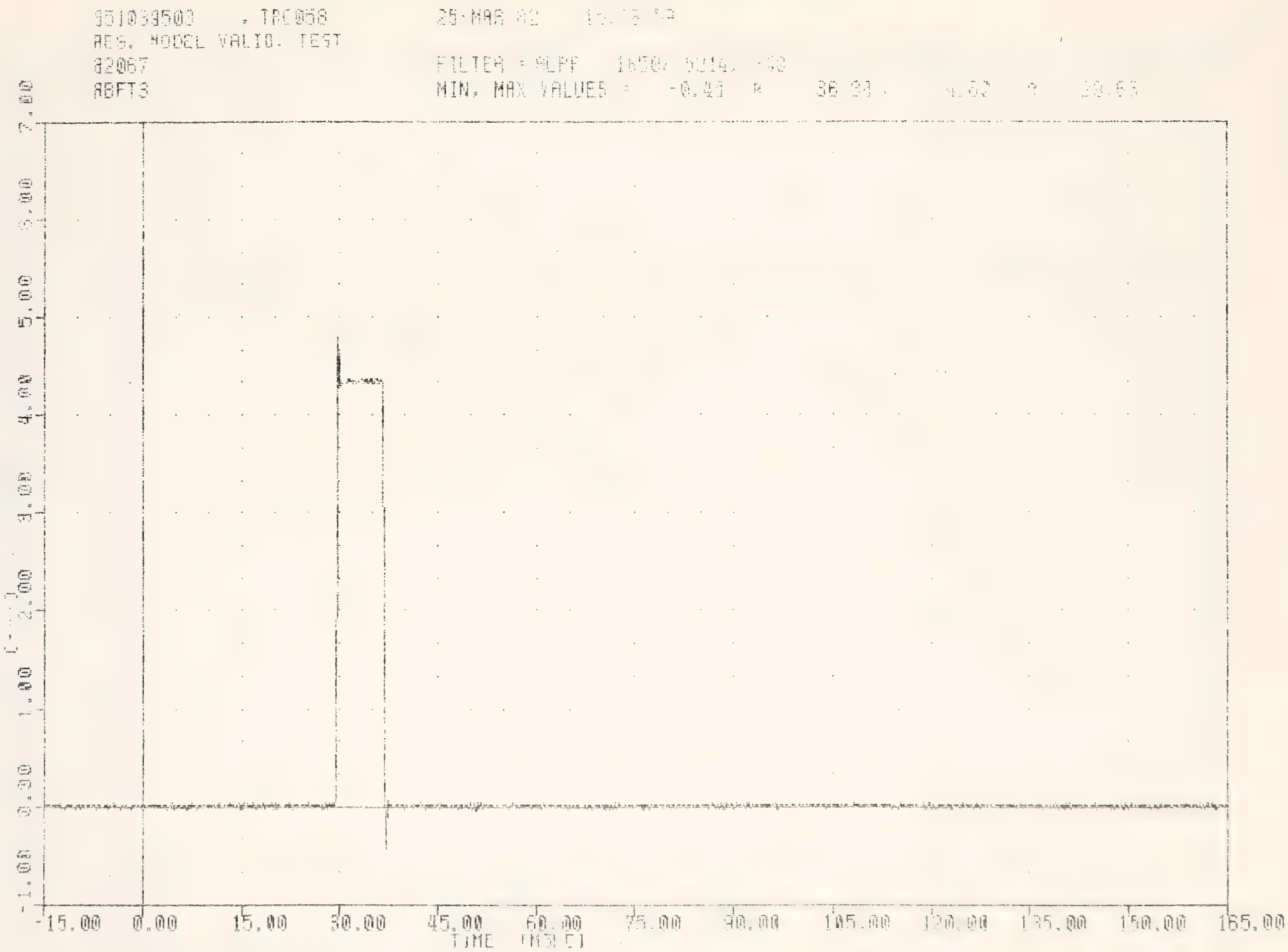
CHEST ACCELERATION Z AXIS PASSENGER

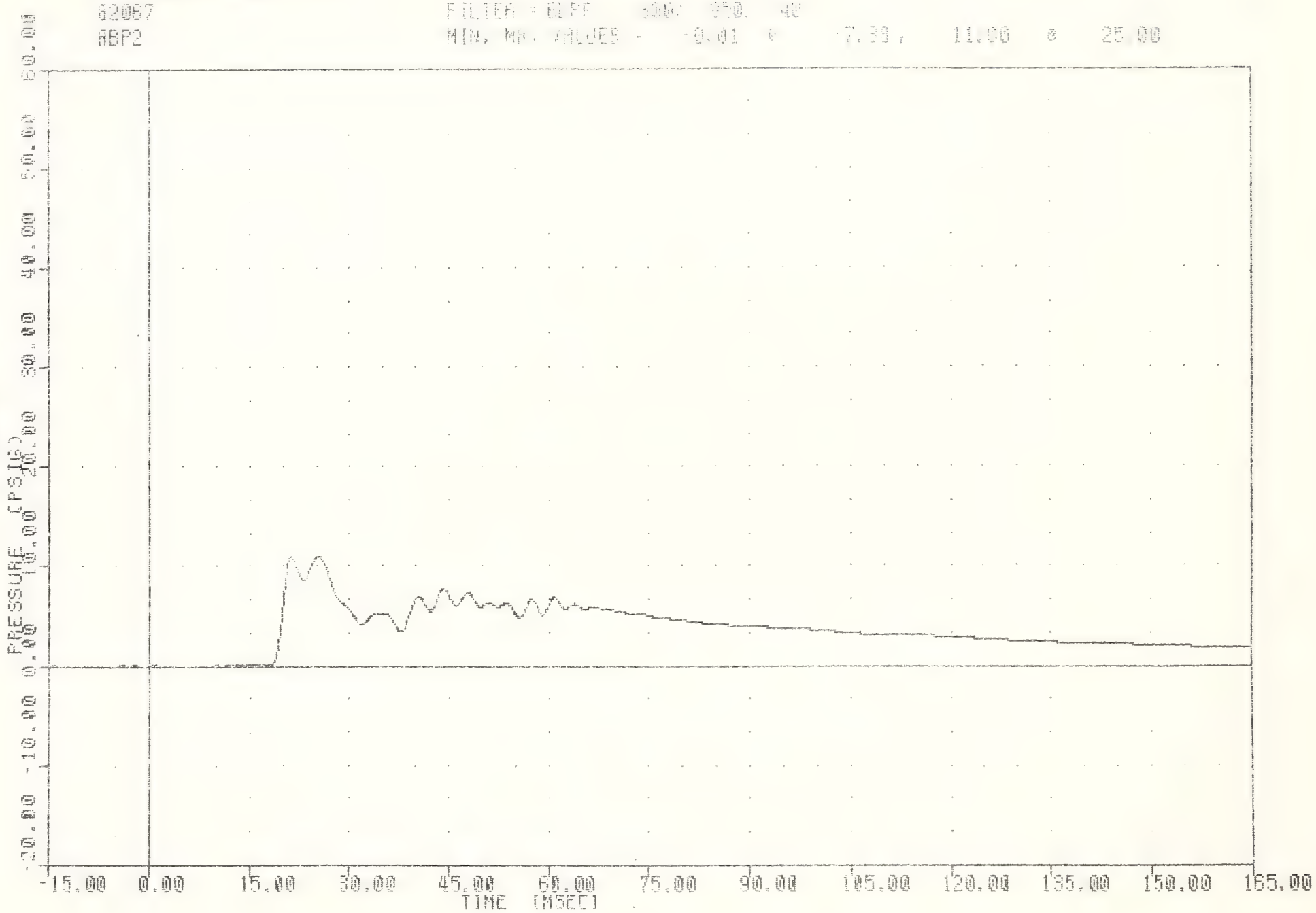


CHEST ACCELERATION RESULTANT PASSENGER

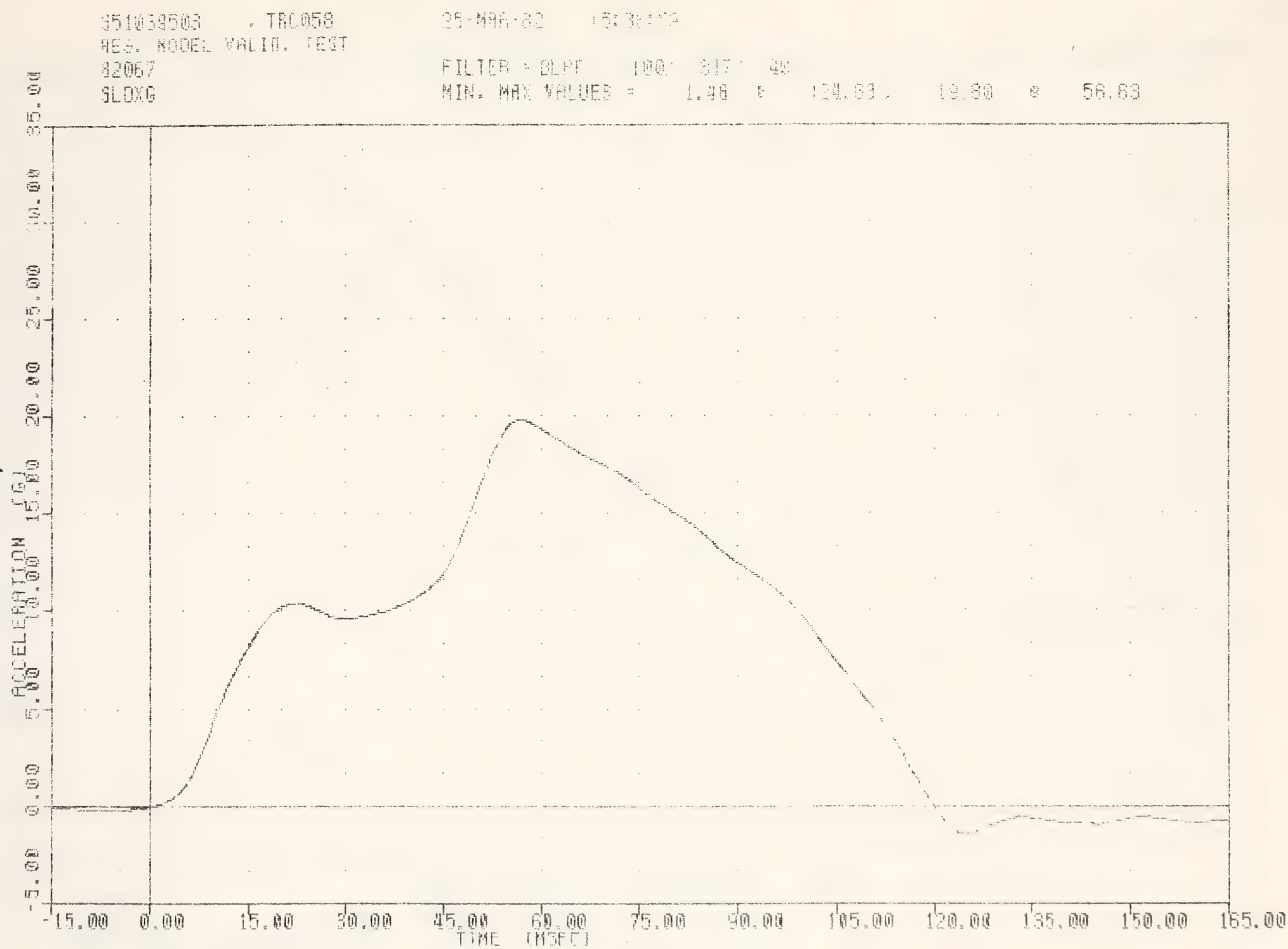


AIR BAG FIRING EVENT PASSENGER


SD1038503 , TRC058
RES. MODEL VALID. TEST
82067
ABFT3
25-MAR 82
FILTER = ALPF
MIN. MAX VALUES =
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
-1.00
-15.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME

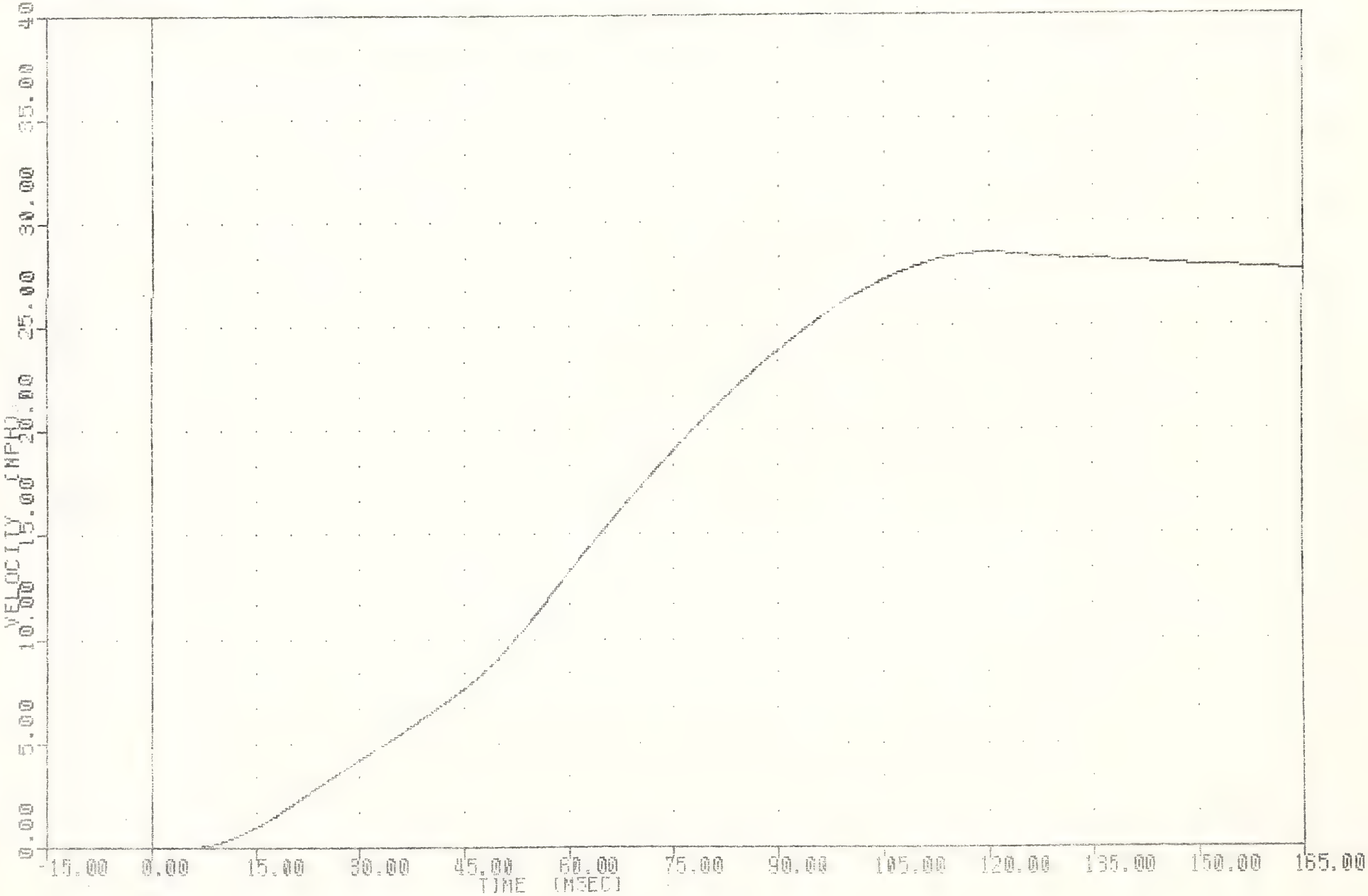


AIR BAG PRESSURE PASSENGER

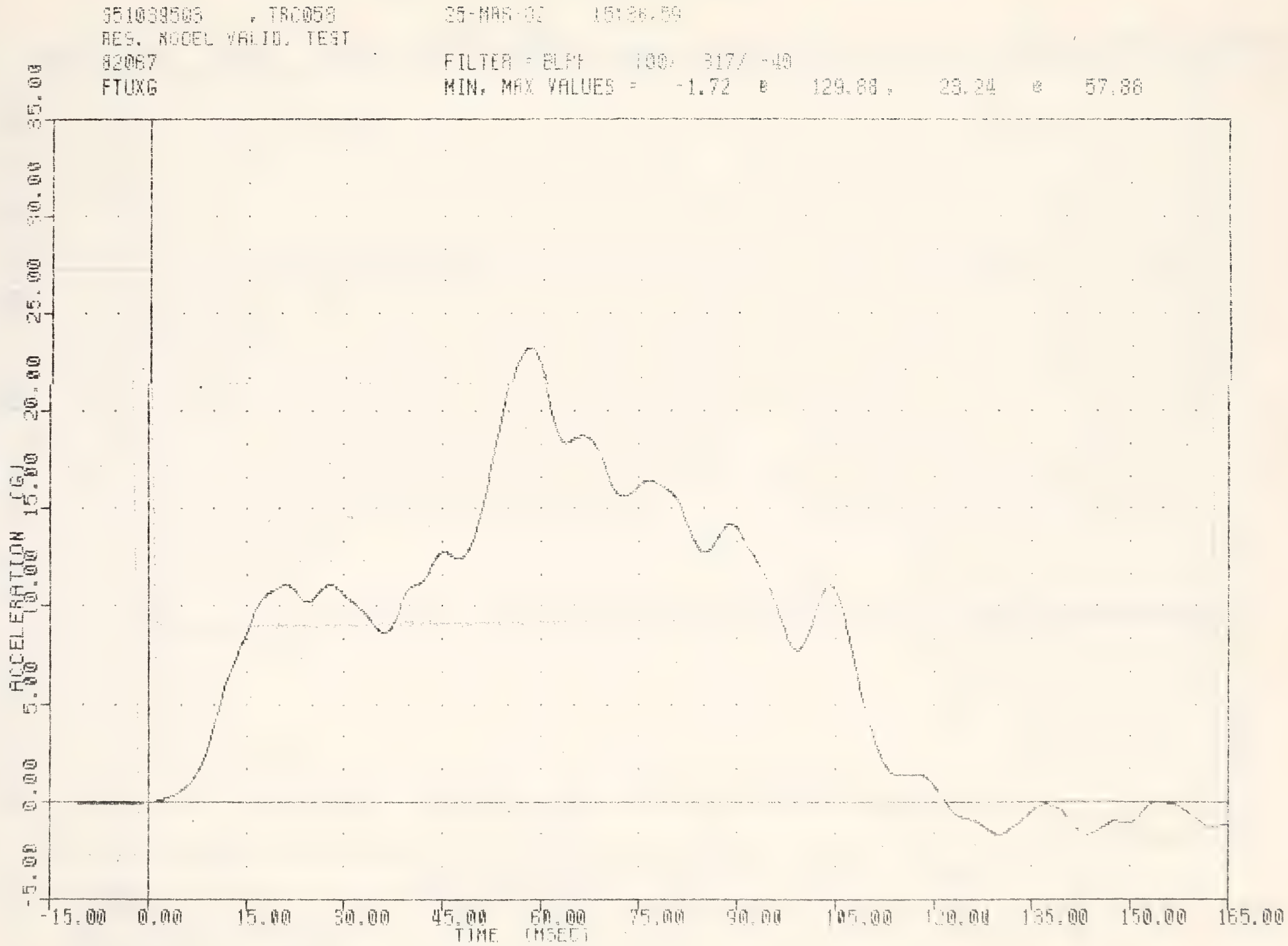


SLED ACCELERATION

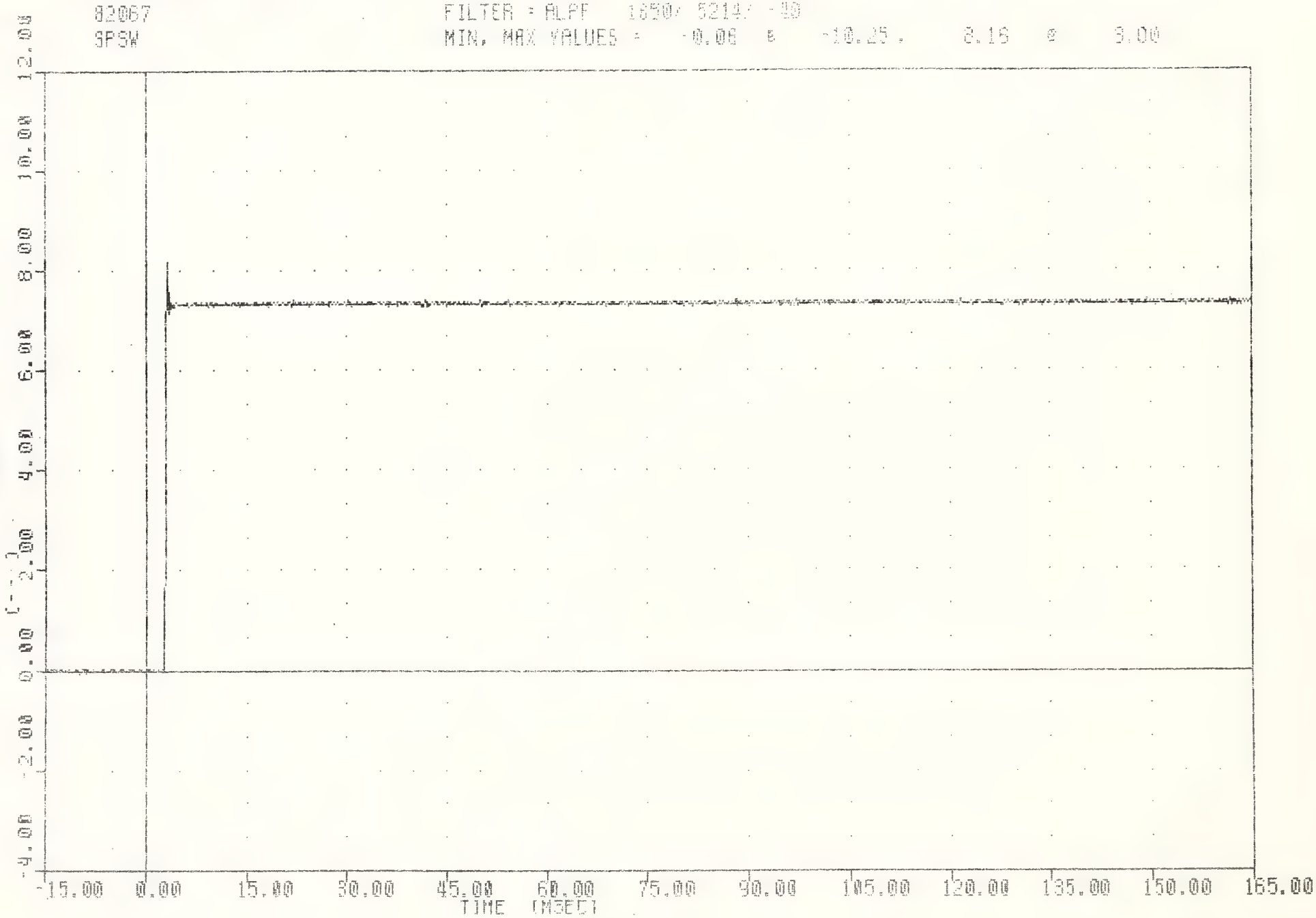
S51039503 , TRC058 29-MAR-82 15:36:59
REG. MODEL VALID. TEST
82067 FILTER = BLPF 100. 317/ -40
SLDXV MIN. MAX VALUES = -0.06 @ 0.63 , 28.49 @ 119.75



SLED VELOCITY IN MPH

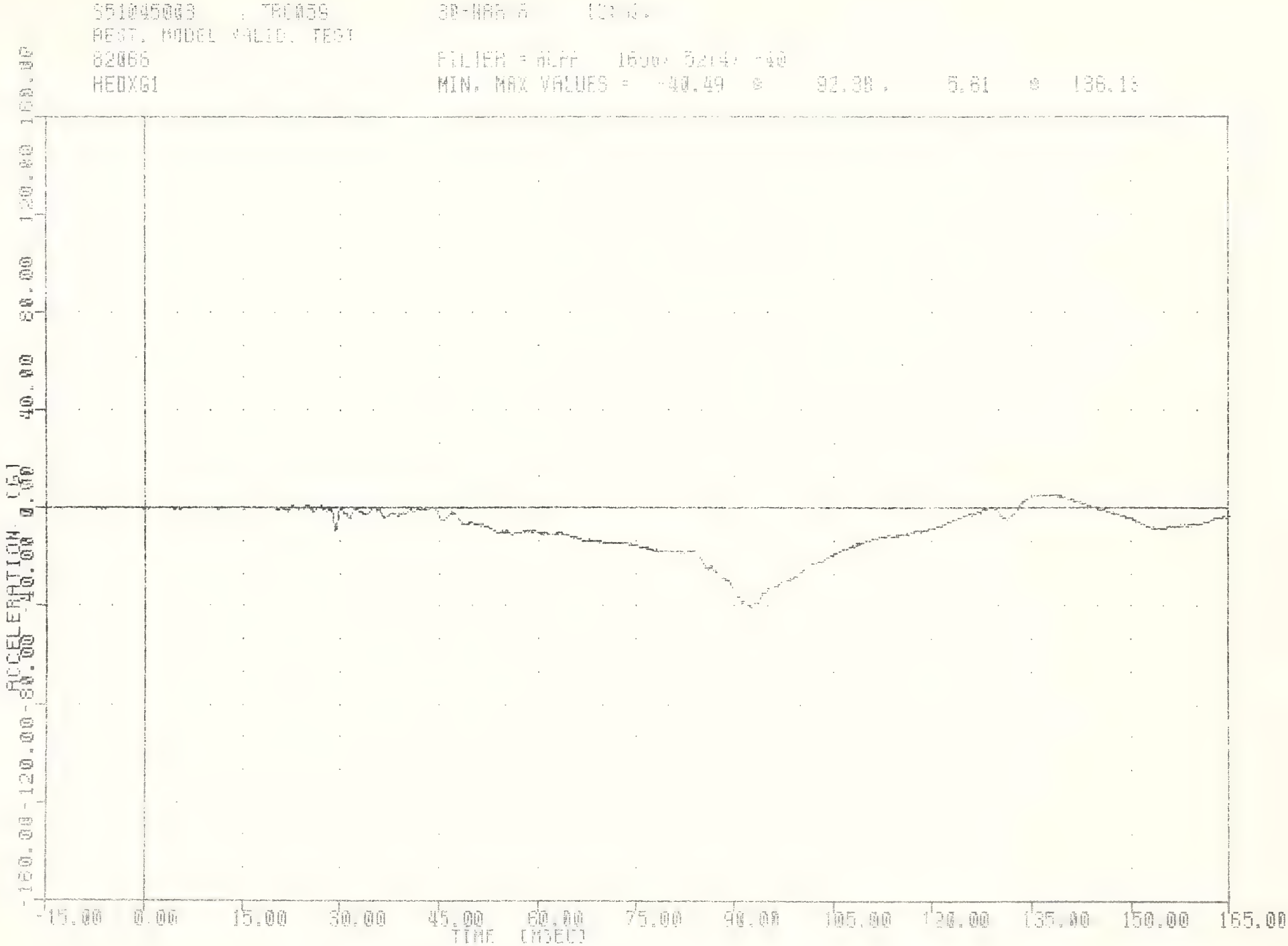


FLOOR PAN TUNNEL ACCELERATION

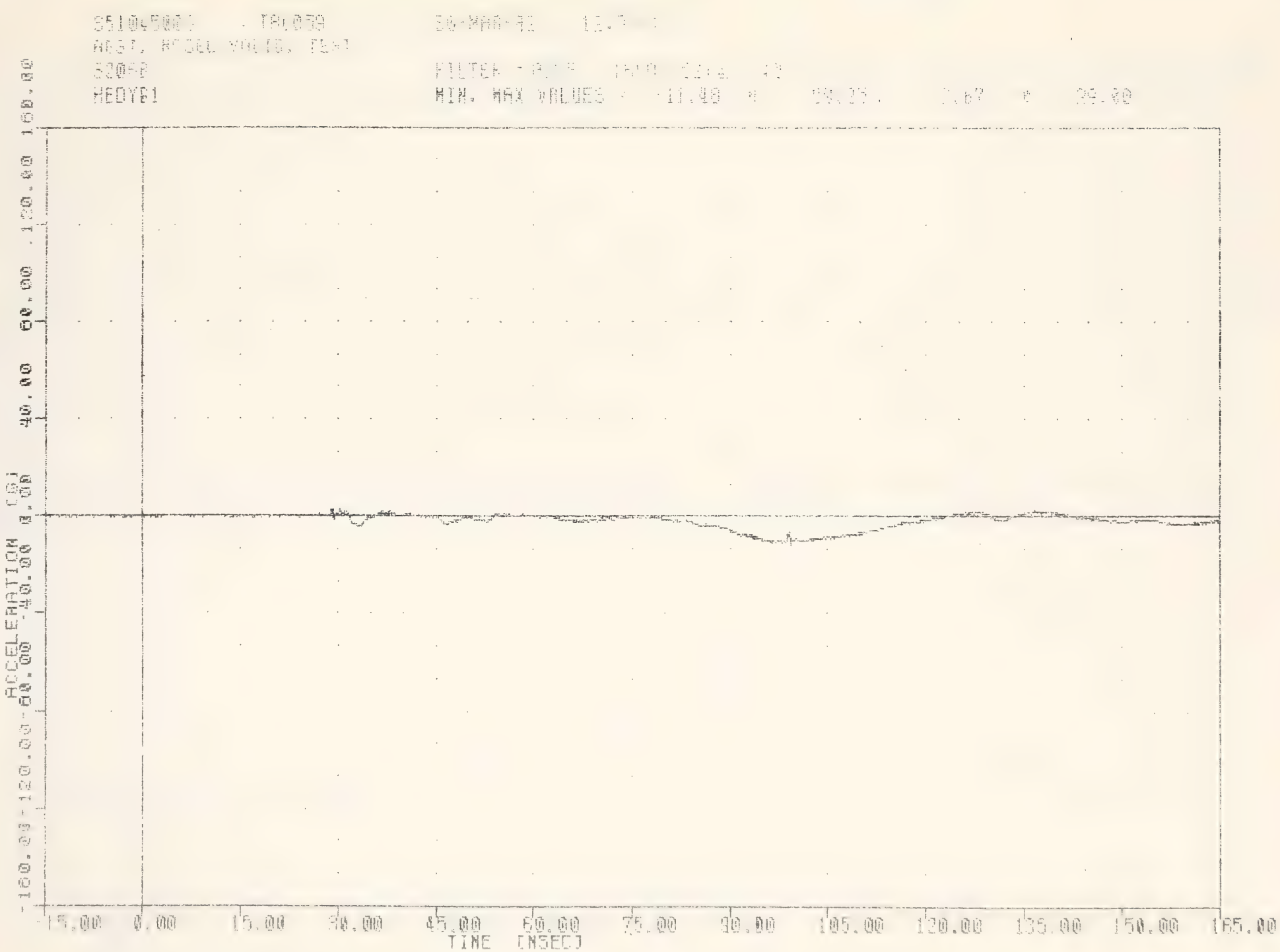


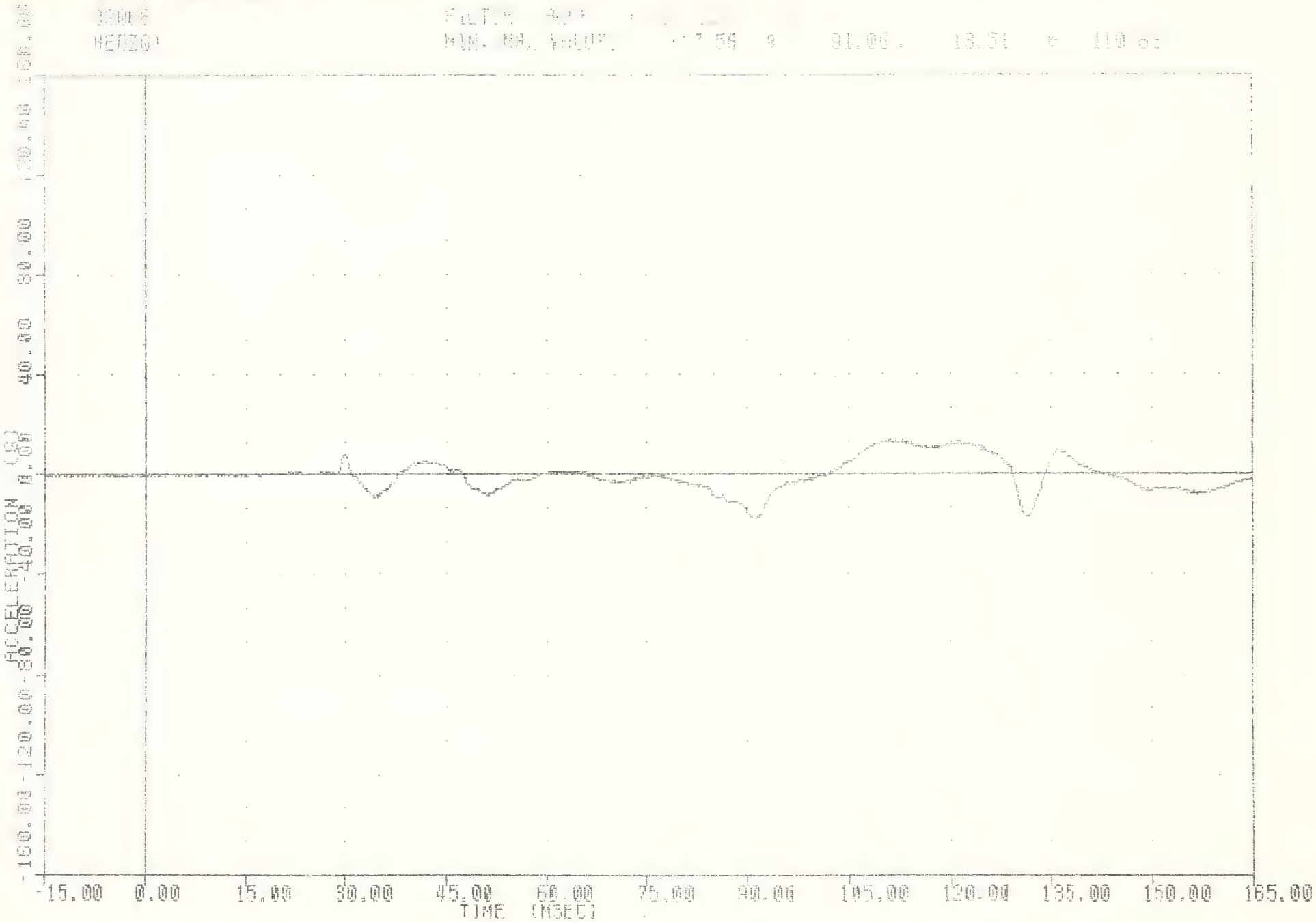
SLED POSITION SWITCH

TEST NO. 4

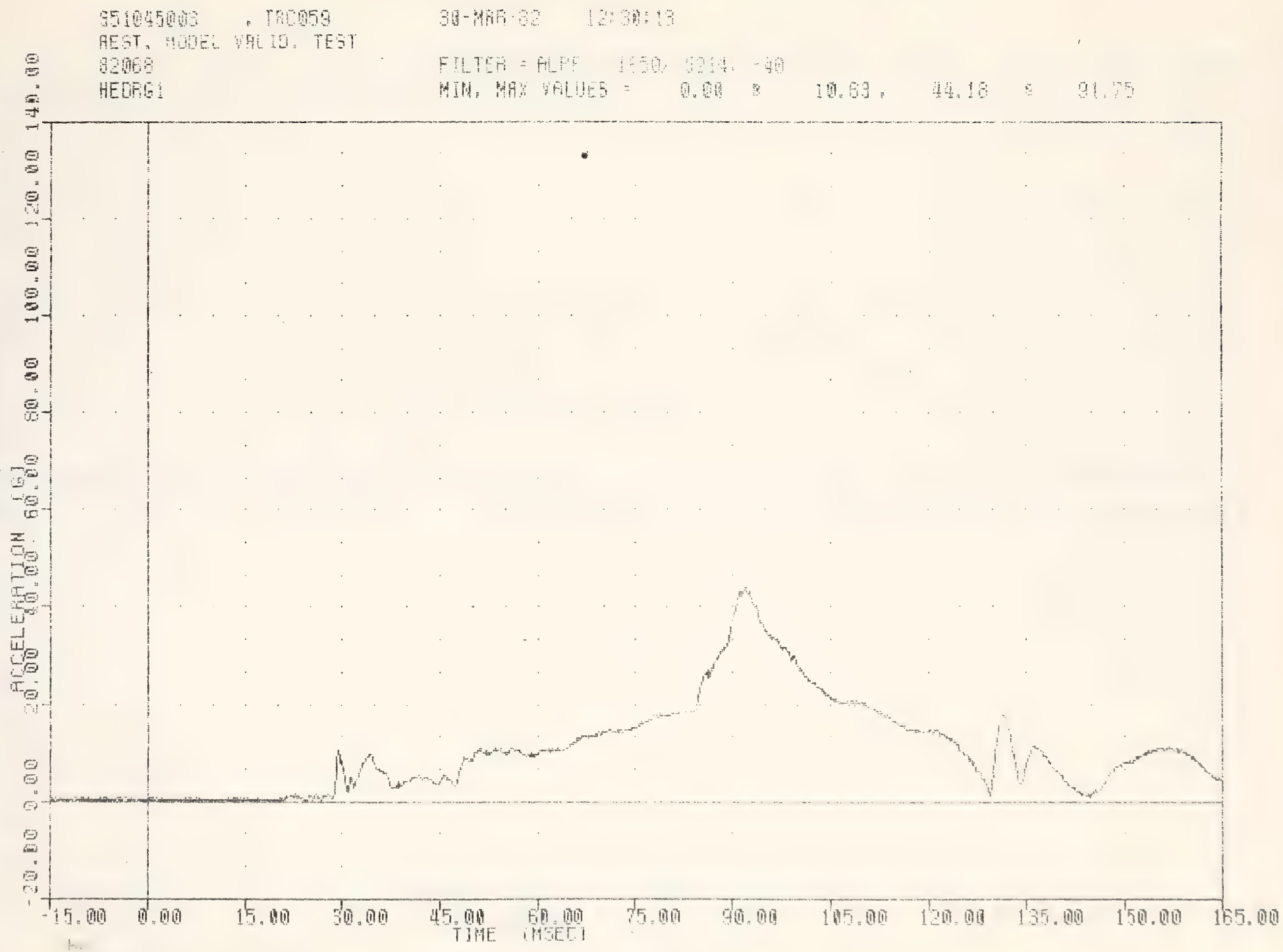


HEAD ACCELERATION X AXIS DRIVER


ACCELERATION [G]
160.00
120.00
80.00
40.00
0.00
-40.00
-80.00
-120.00
-160.00
-15.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME [MSEC]

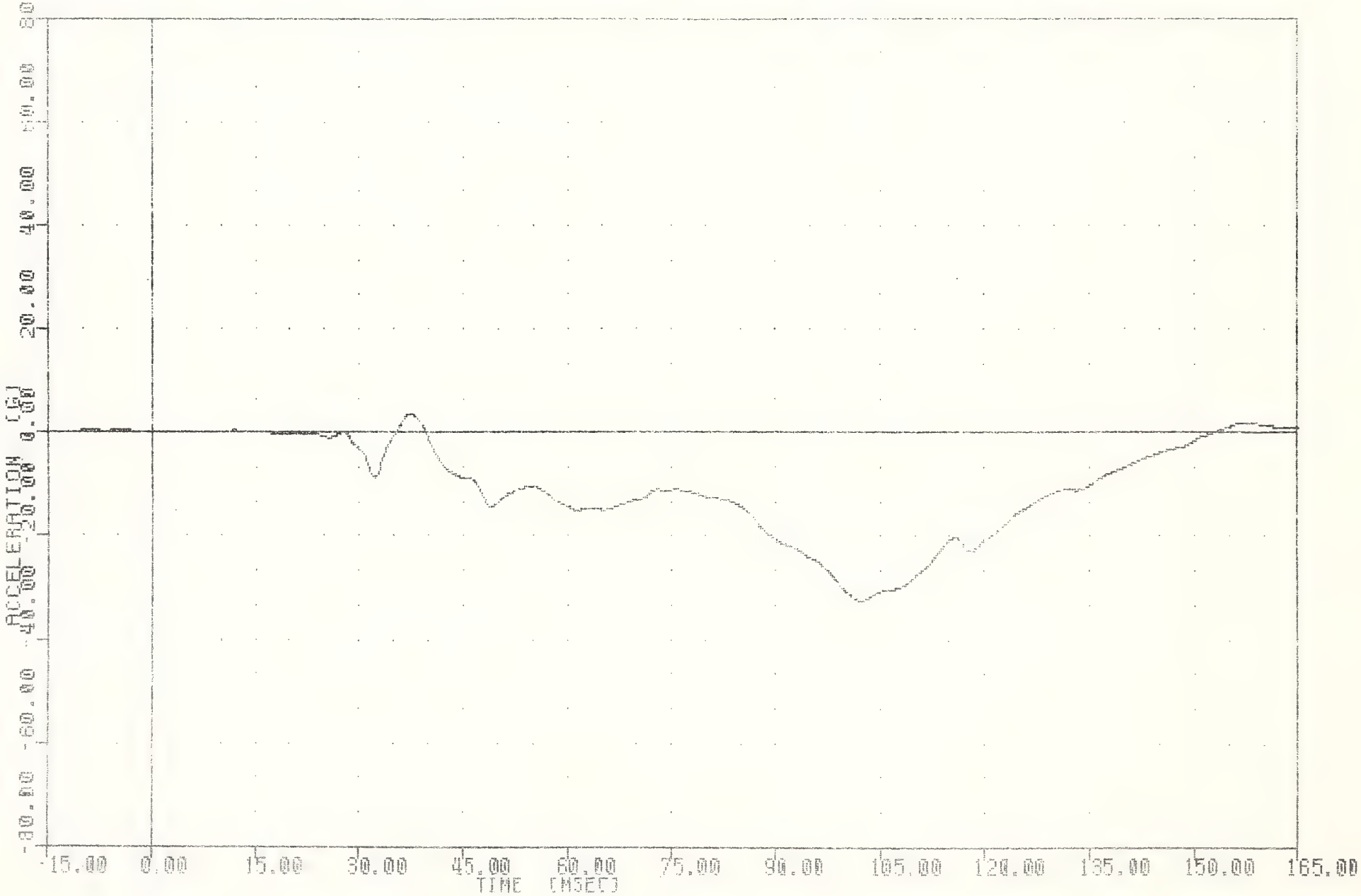


HEAD ACCELERATION Z AXIS DRIVER



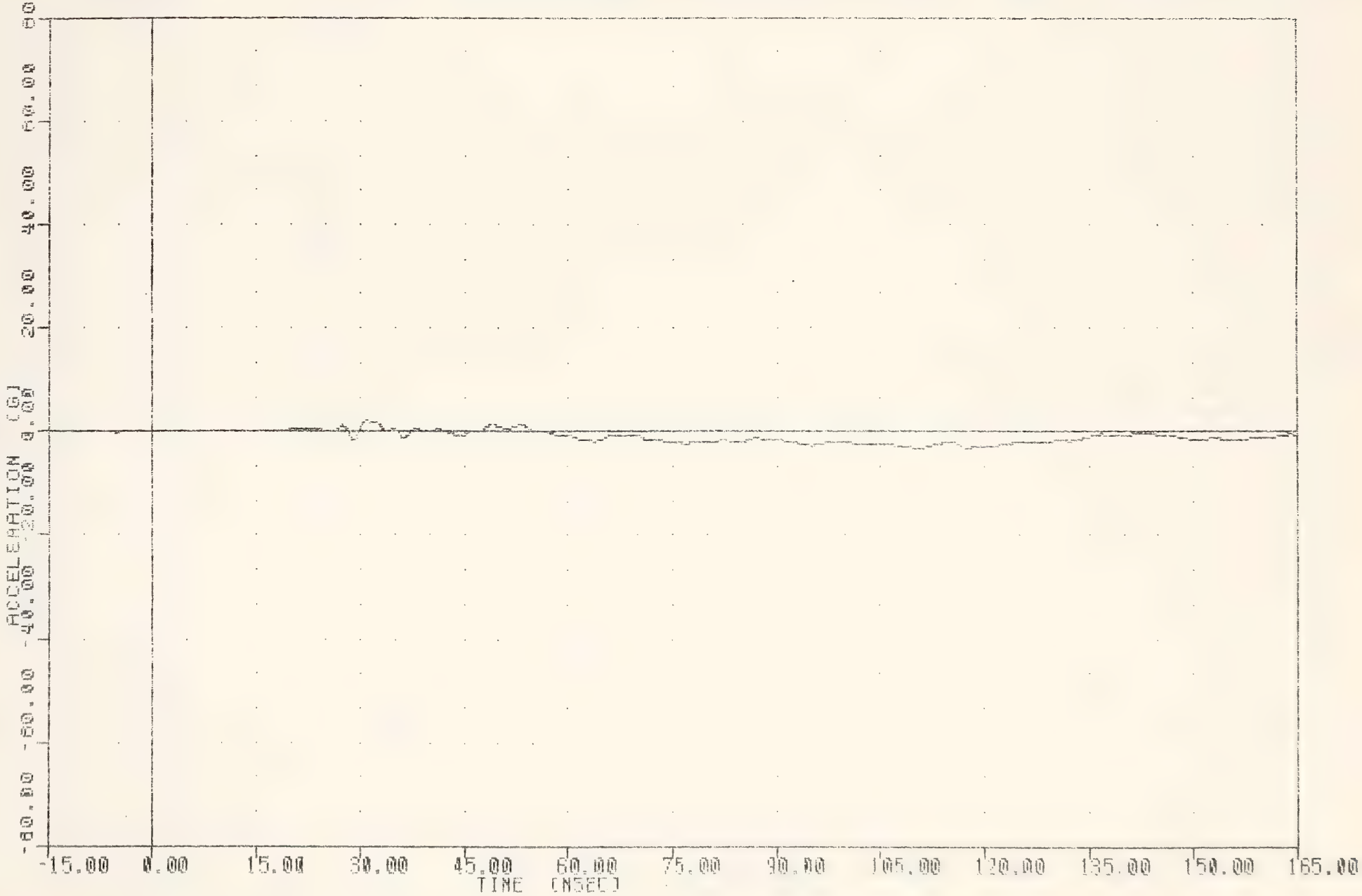
HEAD ACCELERATION RESULTANT DRIVER

S51045003 . TRC059 30-MAR-82 12:50:13
REST. MODEL VALID. TEST
82068 FILTER = BLPF 300/ 950/ -40
CSTXG1 MIN. MAX VALUES = -32.46 @ 102.25 , 3.88 @ 37.25

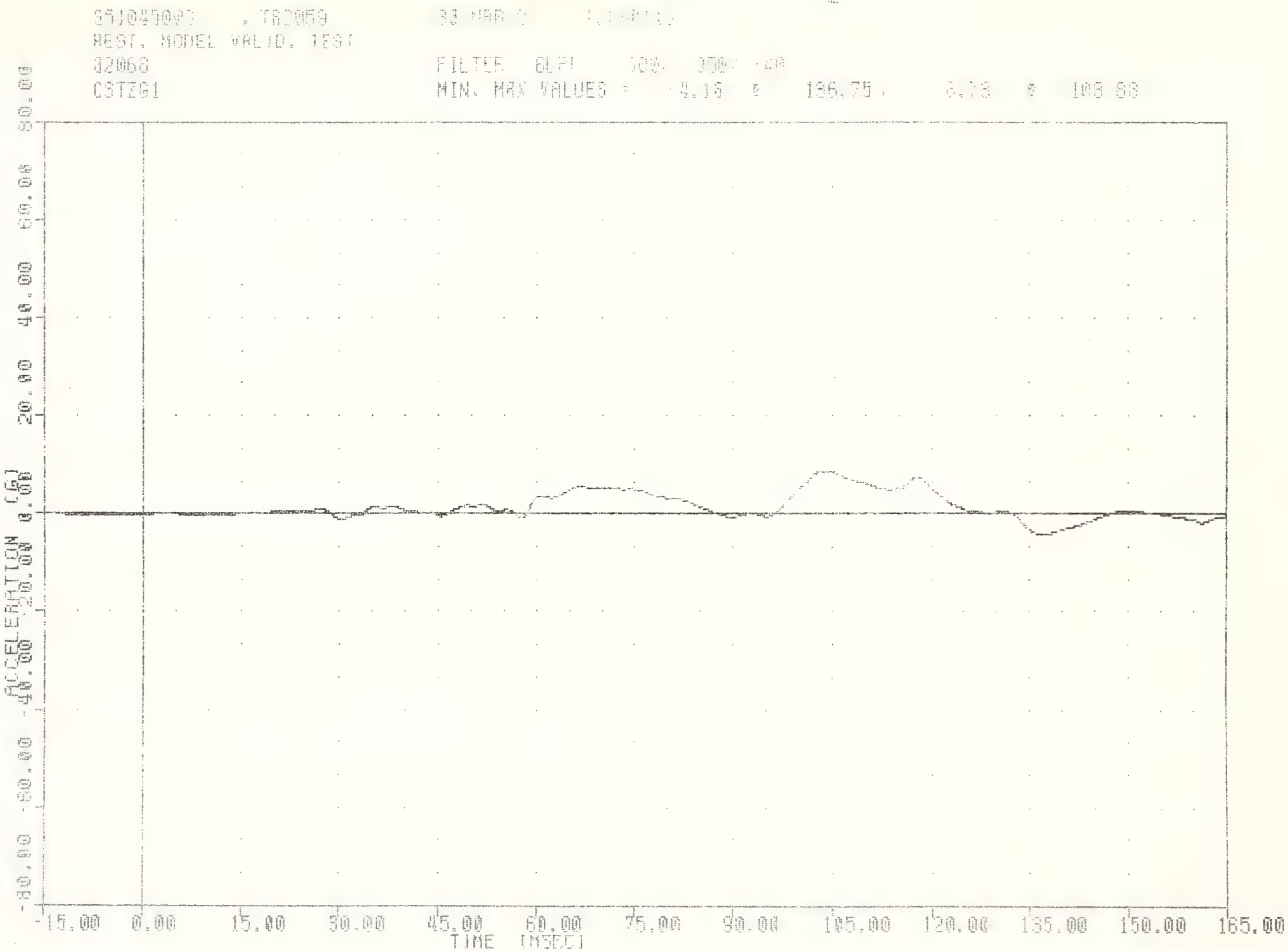


CHEST ACCELERATION X AXIS DRIVER

551045003 , TAC059 30-MAR-82 12:50:18
REST. MODEL VALID. TEST
S2068 FILTER : BLFF 300/ 950/ 40
CSTYG1 MIN. MAX VALUES = -3.22 @ 117.38 , 2.07 @ 30.75

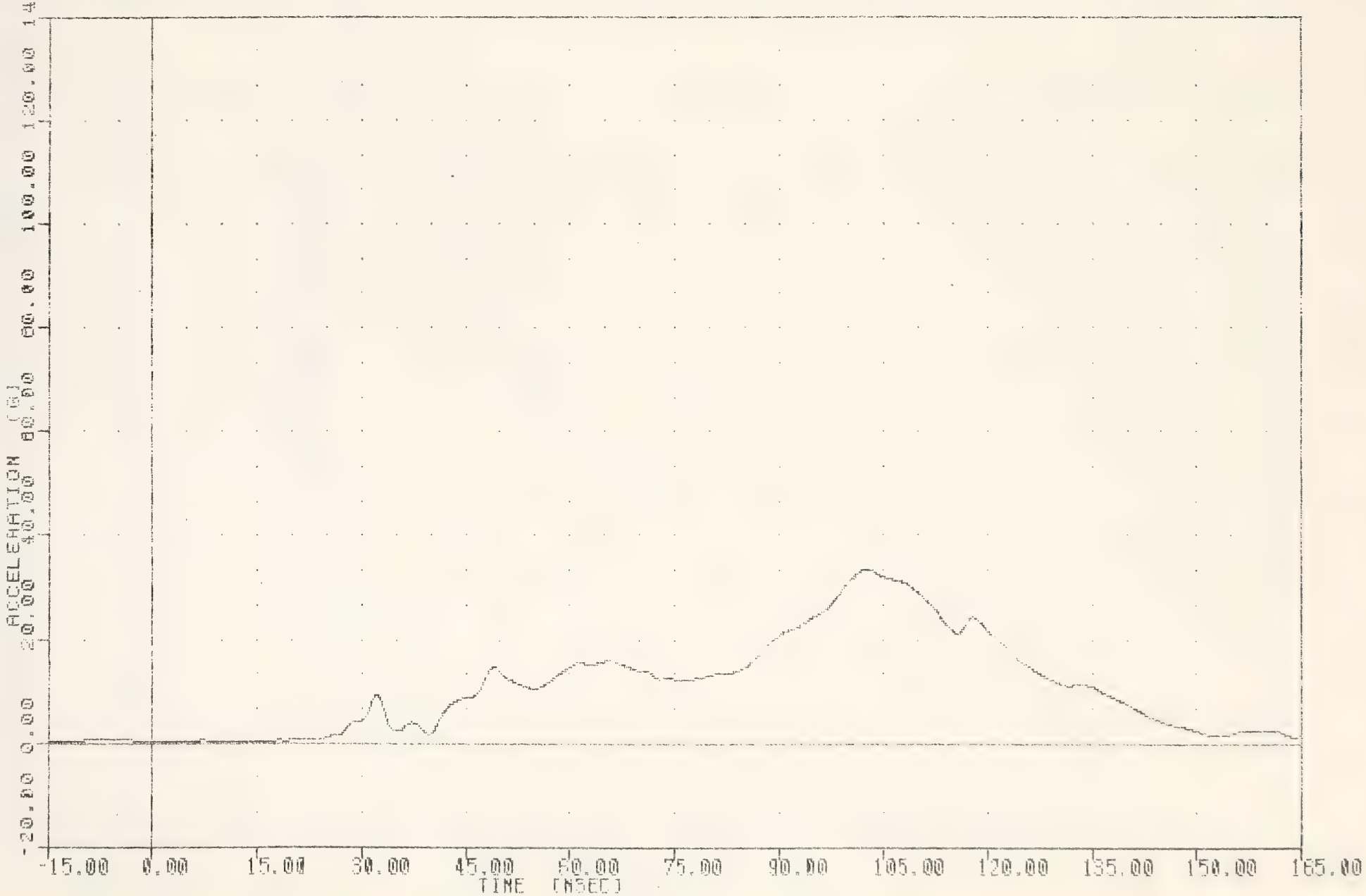


CHEST ACCELERATION , AXIS DRIVER

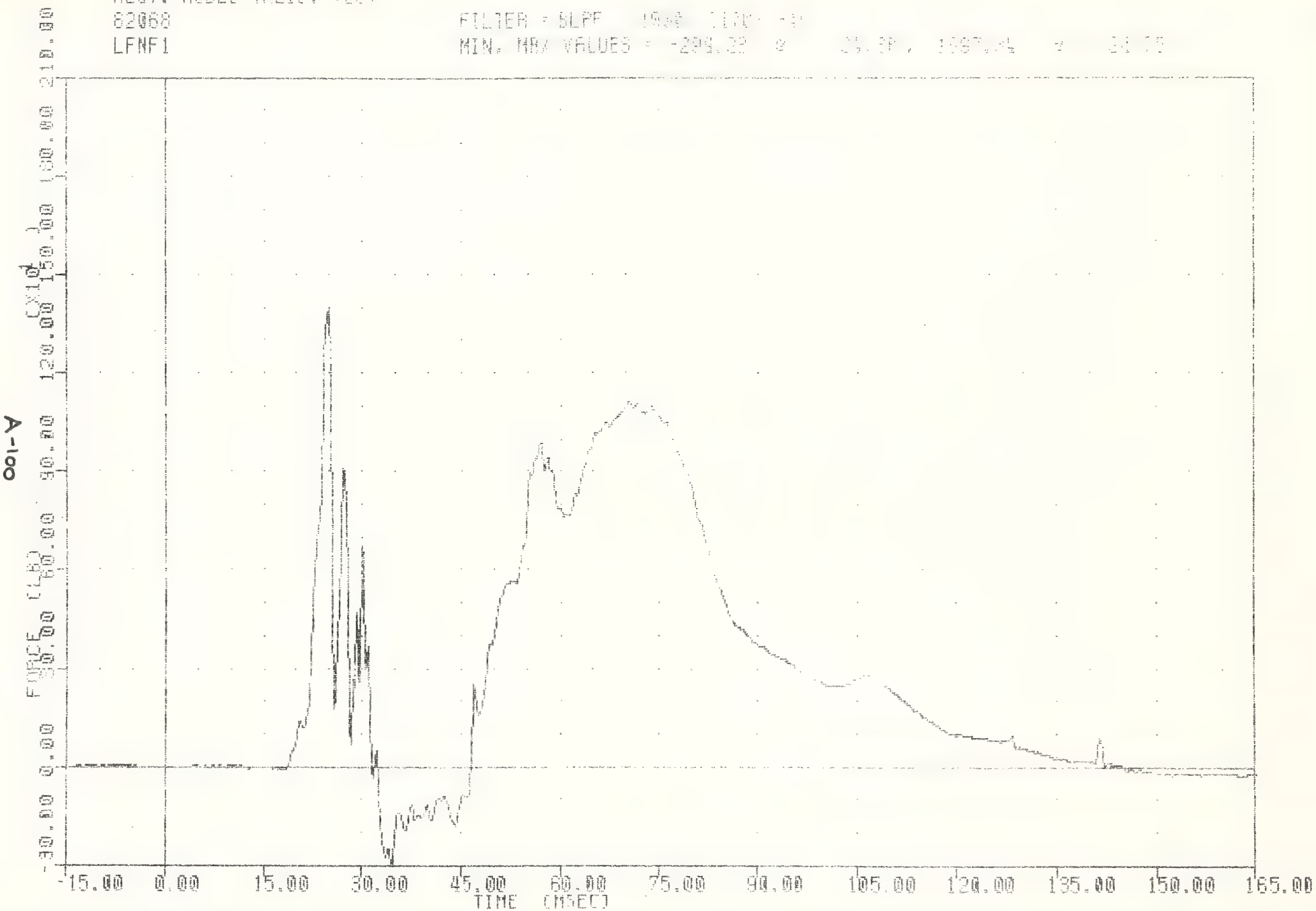


CHEST ACCELERATION Z AXIS DRIVER

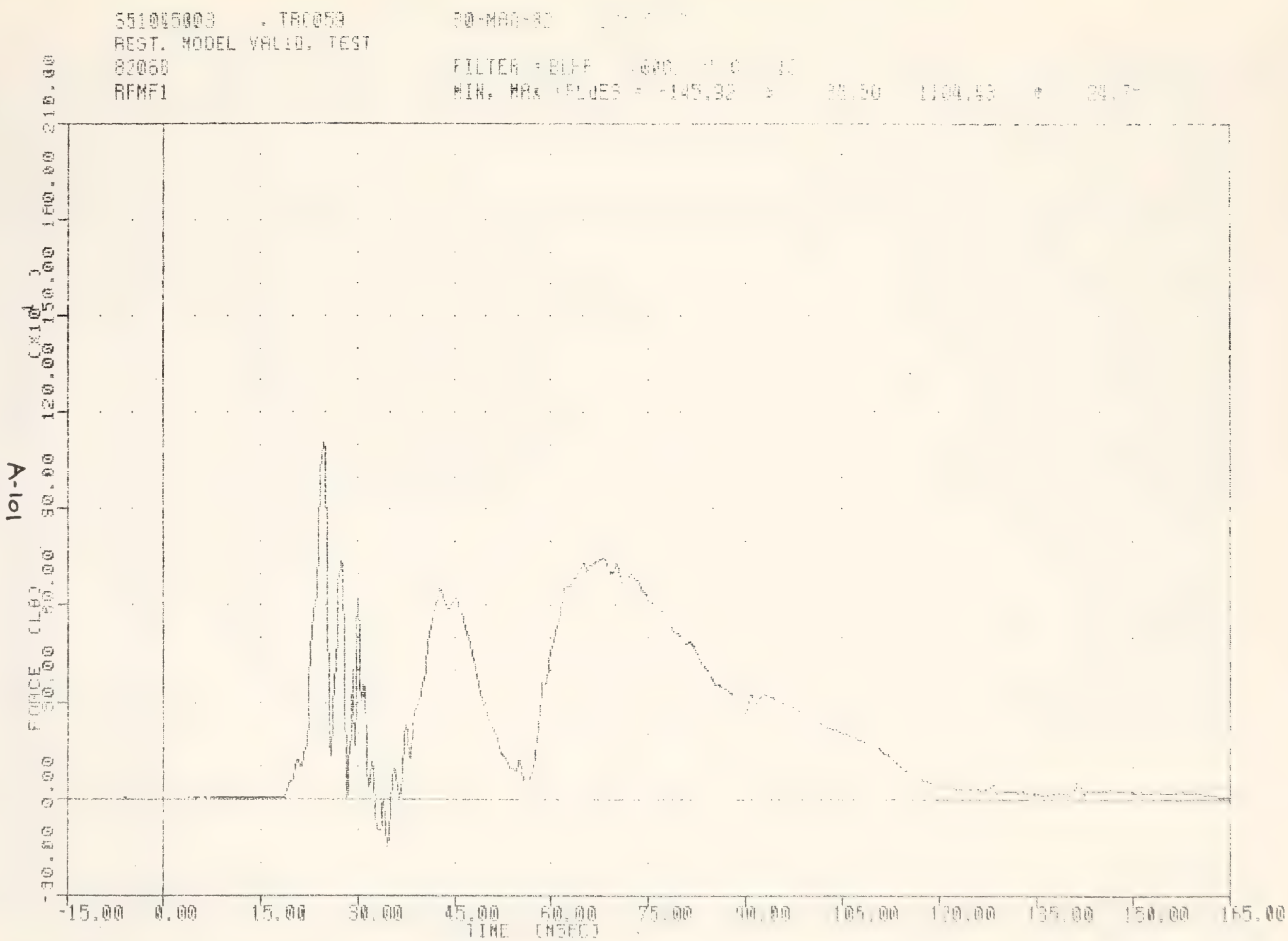
551045003 , TAL050 30-MAR-82 [illegible]
REST. MODEL VALID. TEST
82066 FILTER = BUTF 300. 350/ [illegible]
CSTRB1 MIN. MAX VALUES = 0.82 @ -0.75 , 53.57 + 102.88



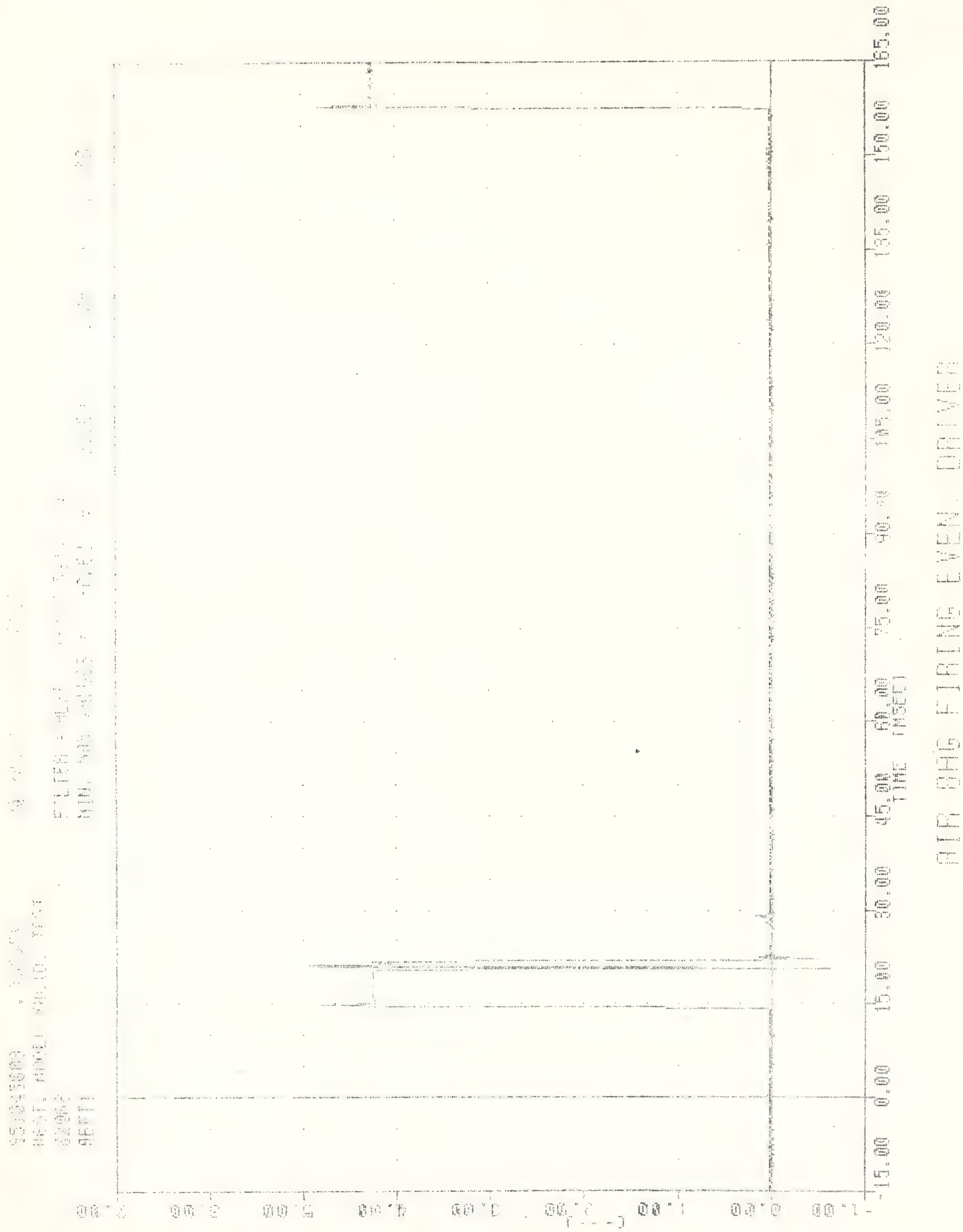
CHEST ACCELERATION RESULTANT DRIVER

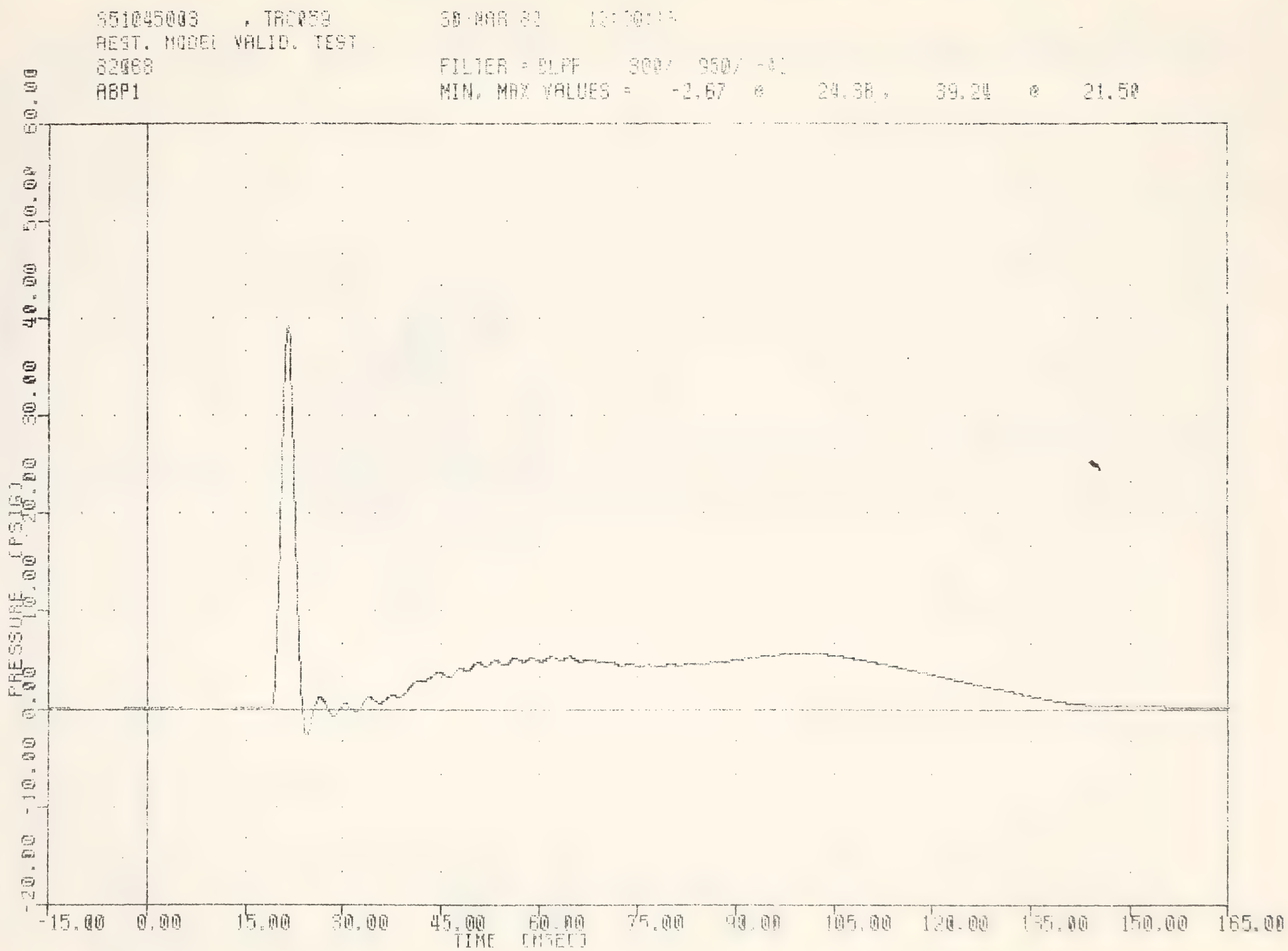


LEFT FEMUR FORCE DRIVER

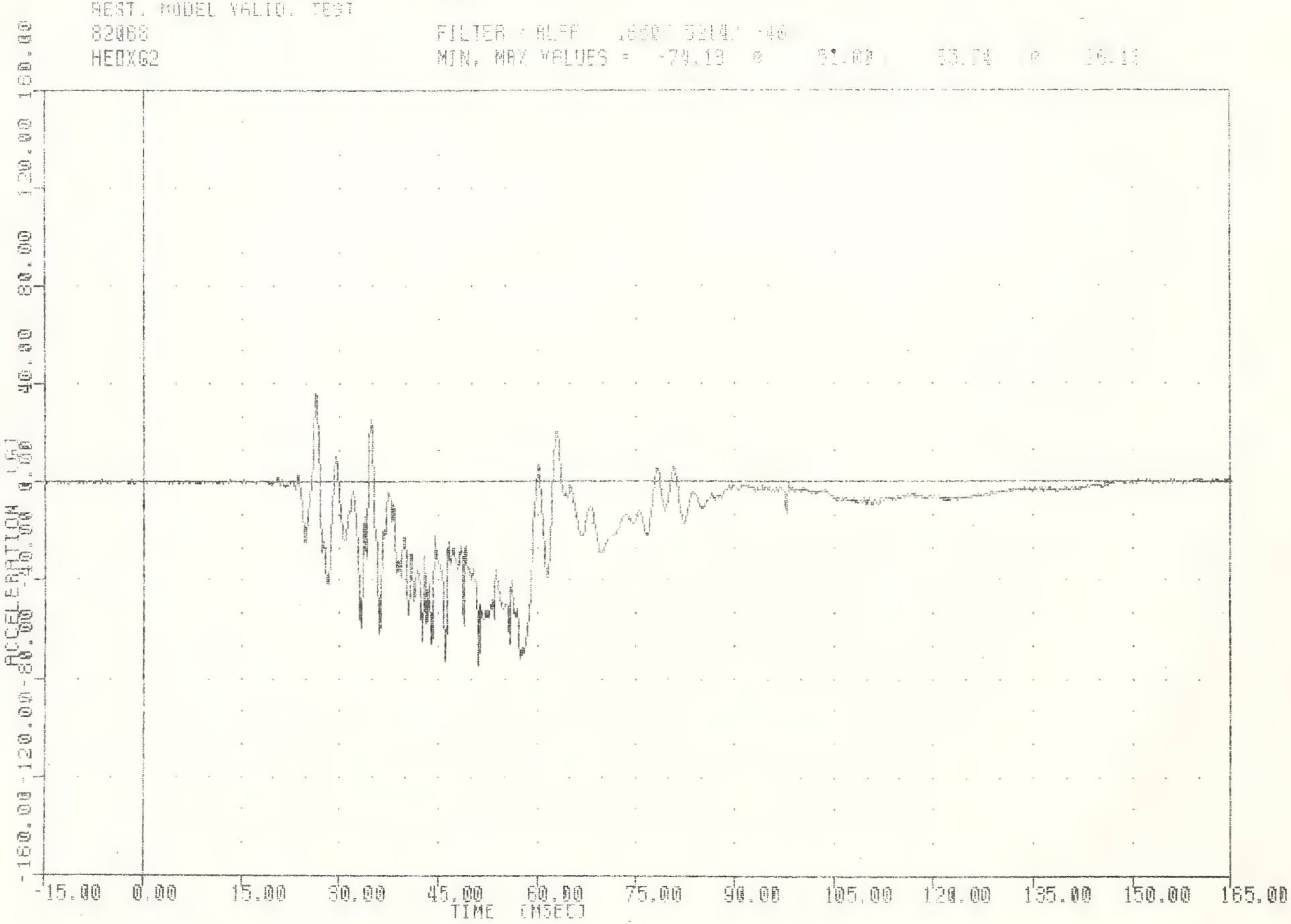


RIGHT FEMUR FORCE DRIVER

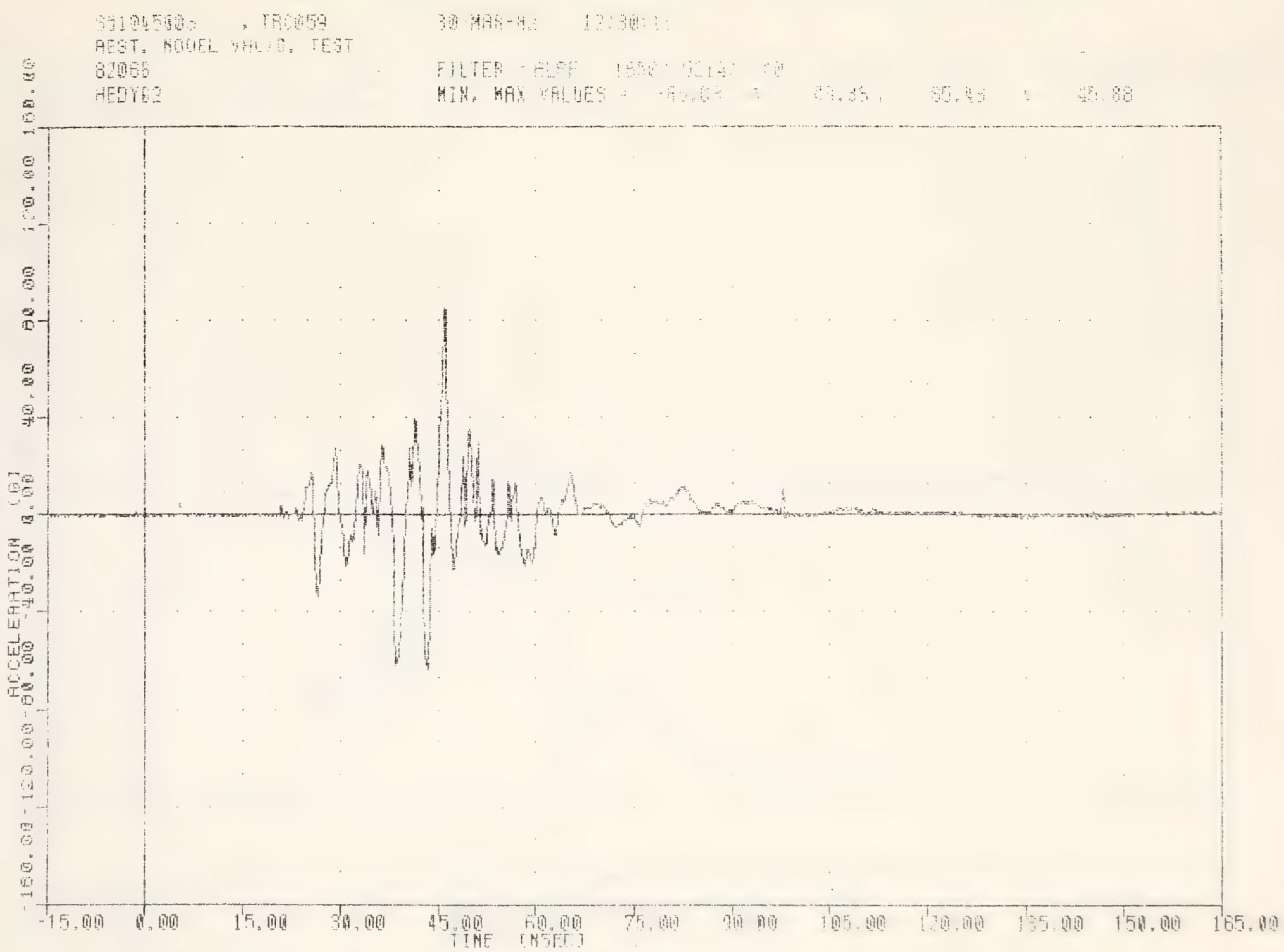

-15.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)
-1.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00



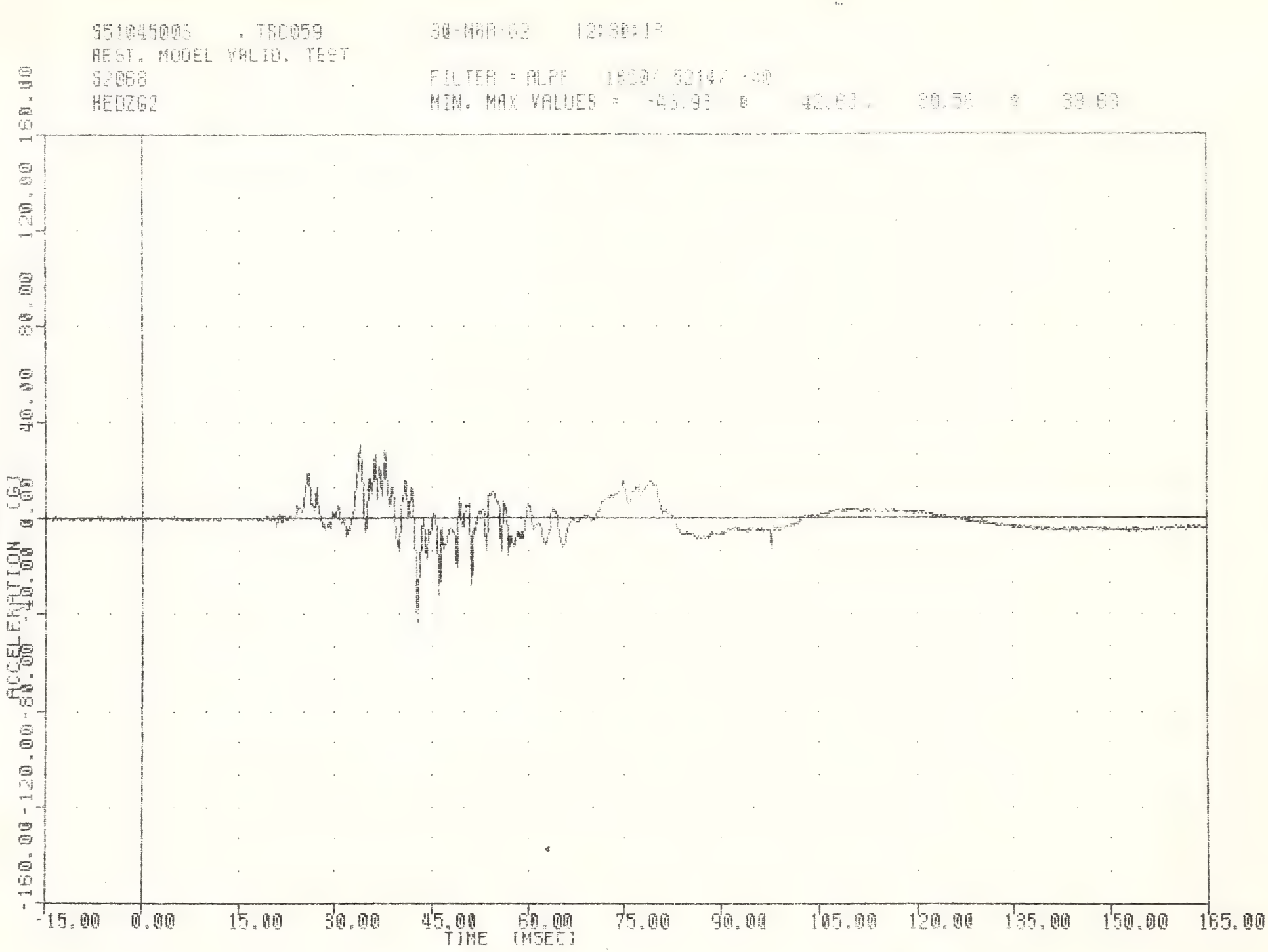
AIR BAG PRESSURE DRIVER



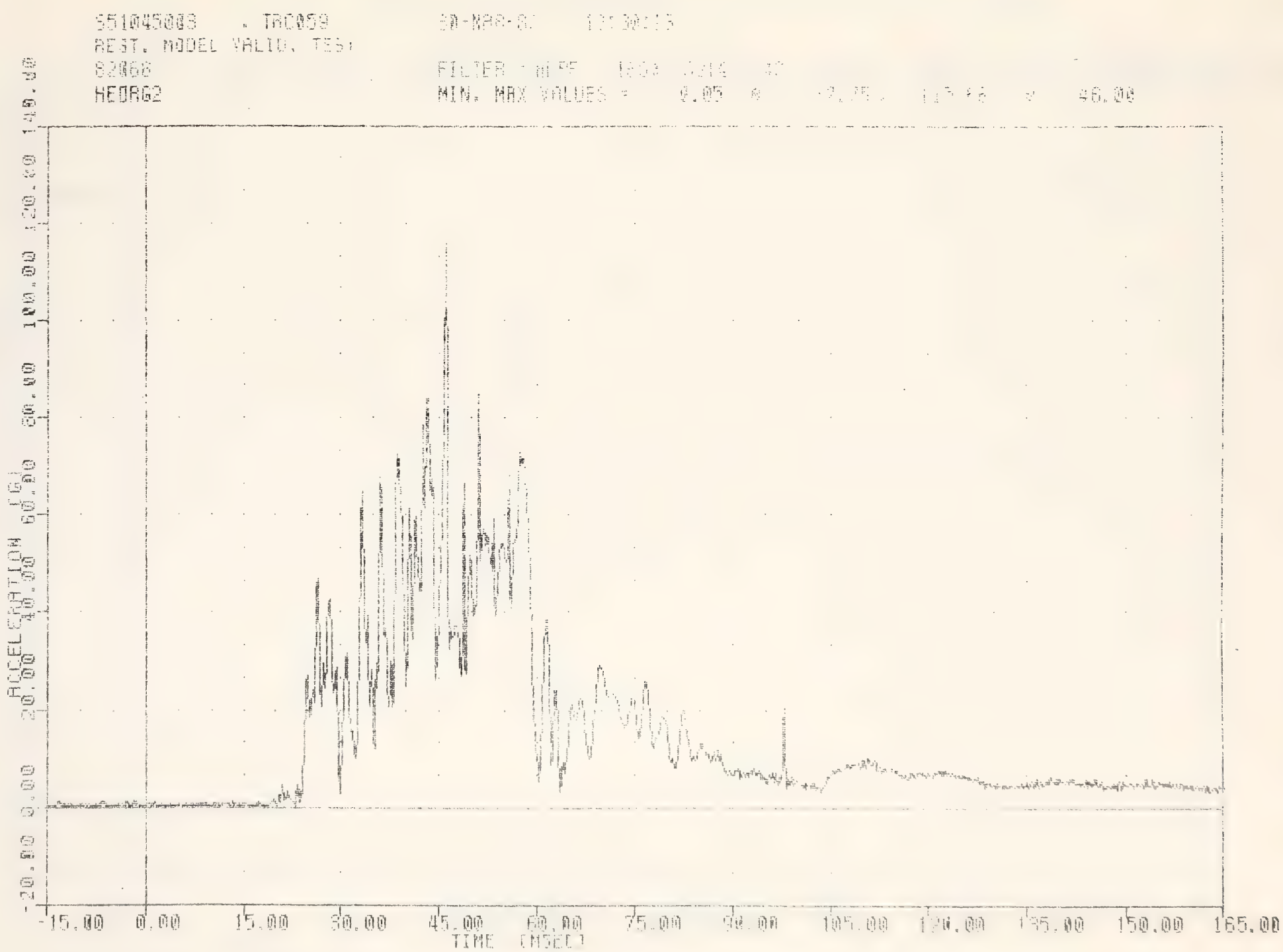
HEAD ACCELERATION X AXIS PASSENGER



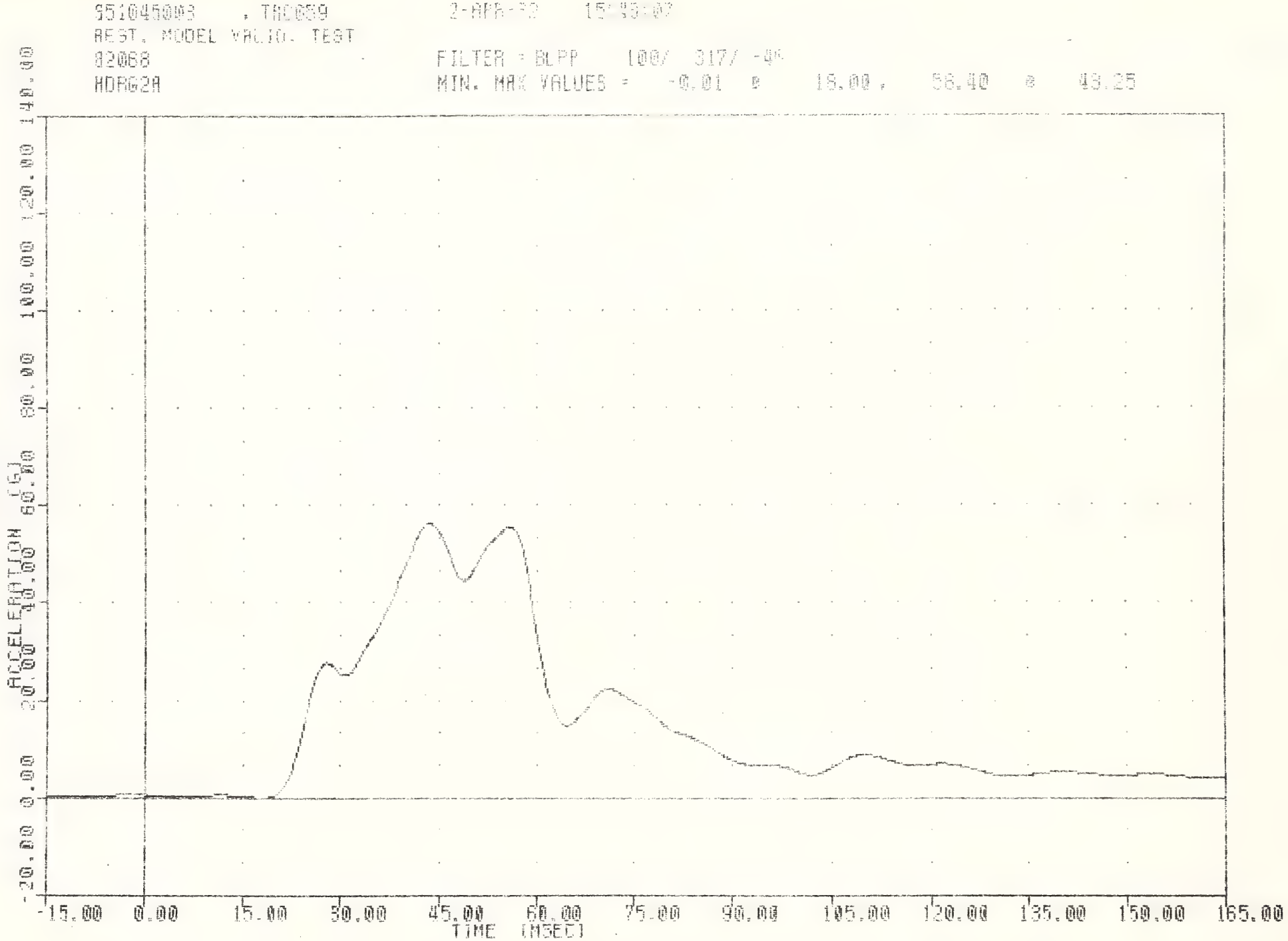
HEAD ACCELERATION Y AXIS PASSENGER



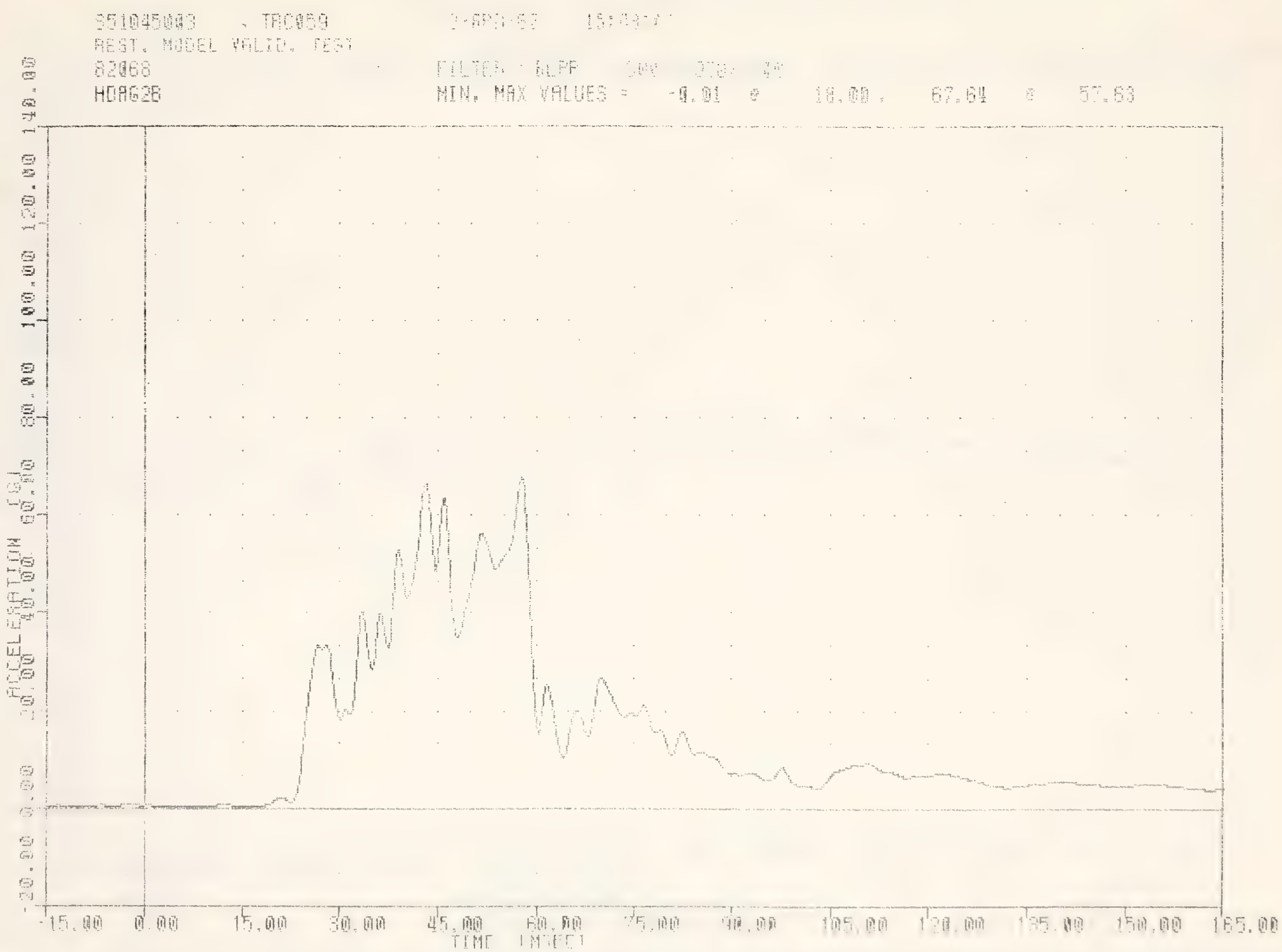
HEAD ACCELERATION Z AXIS PASSENGER



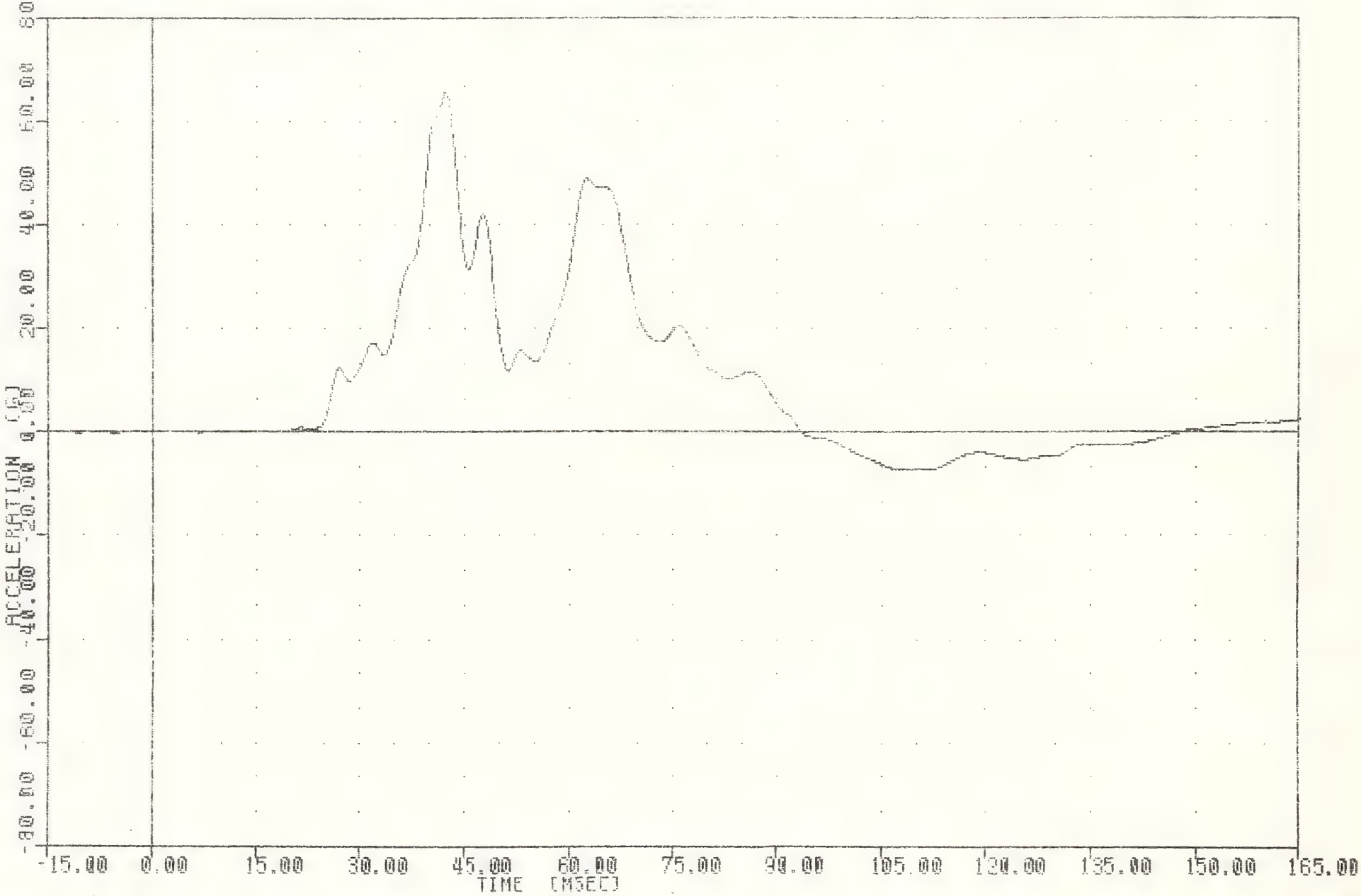
HEAD ACCELERATION RESULTANT PASSENGER



3 YR OLD HEAD RESULTANT (CLASS 100)

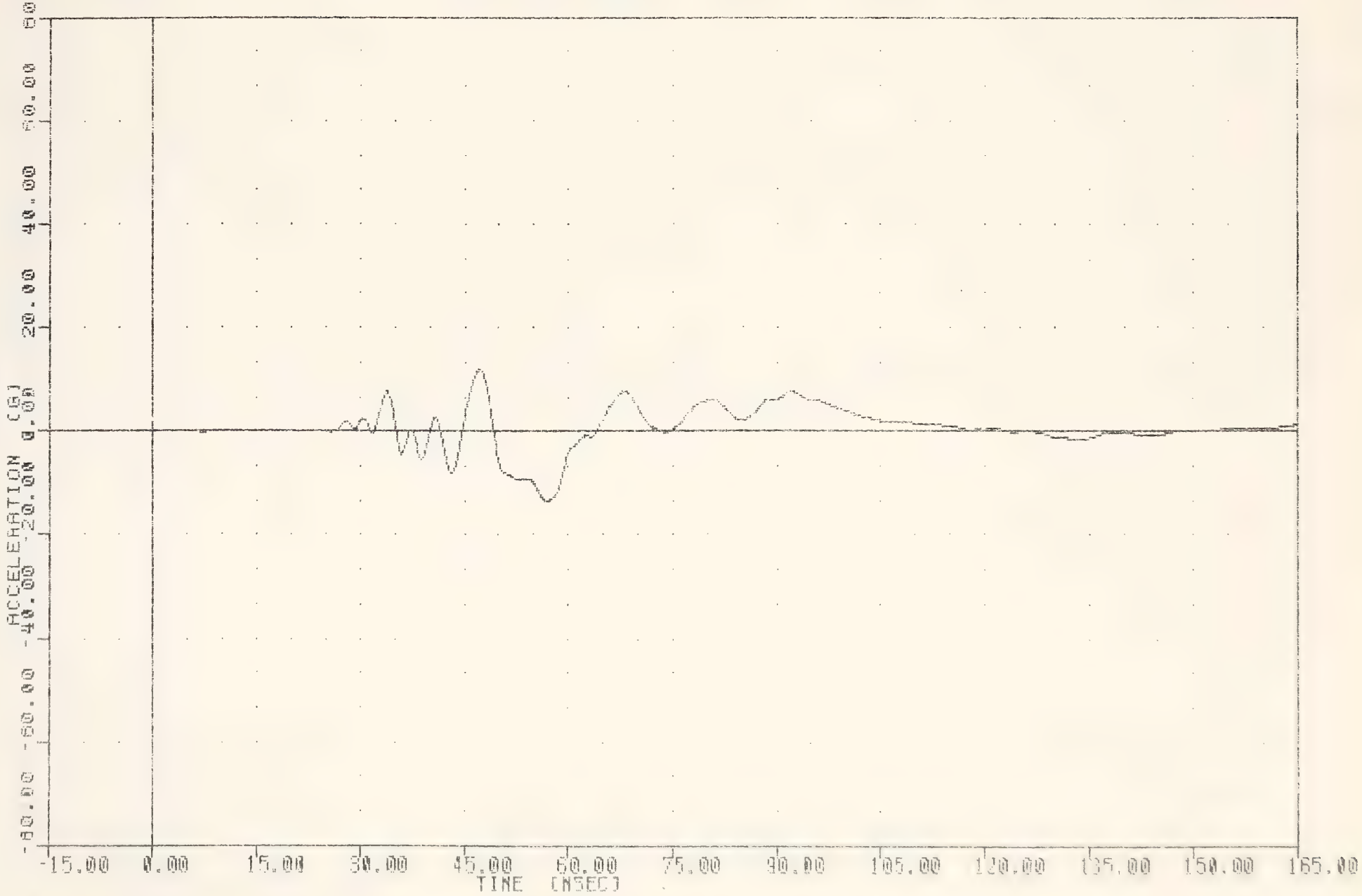

351045003 , TRC059
REST. MODEL VALID. TEST
82068
HDA628
FILTER : 6LPF
MIN, MAX VALUES = -9.01 @ 18.00 , 67.64 @ 57.63
ACCELERATION (G)
-20.00 0.00 20.00 40.00 60.00 80.00 100.00 120.00 140.00
-15.00 0.00 15.00 30.00 45.00 60.00 75.00 90.00 105.00 120.00 135.00 150.00 165.00
TIME (MSEC)

S51045003 , TRC059 30-MAR-82 12:30:13
REST. MODEL VALID. TEST
82058 FILTER = BLAF 300/ 950/ -40
CSTXG2 MIN, MAX VALUES = -7.25 @ 100.50 , 85.63 @ 42.25

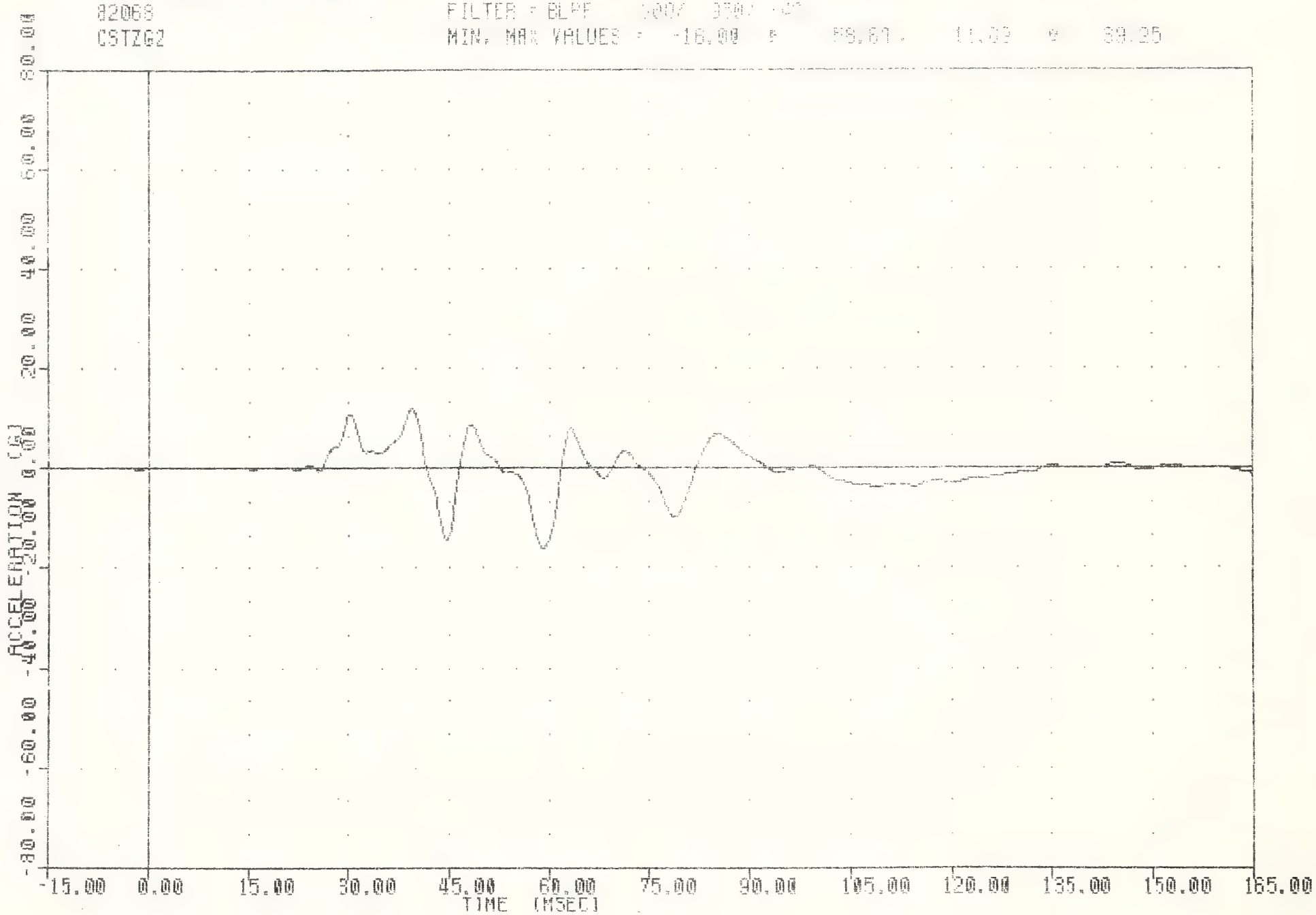


CHEST ACCELERATION X AXIS PASSENGER

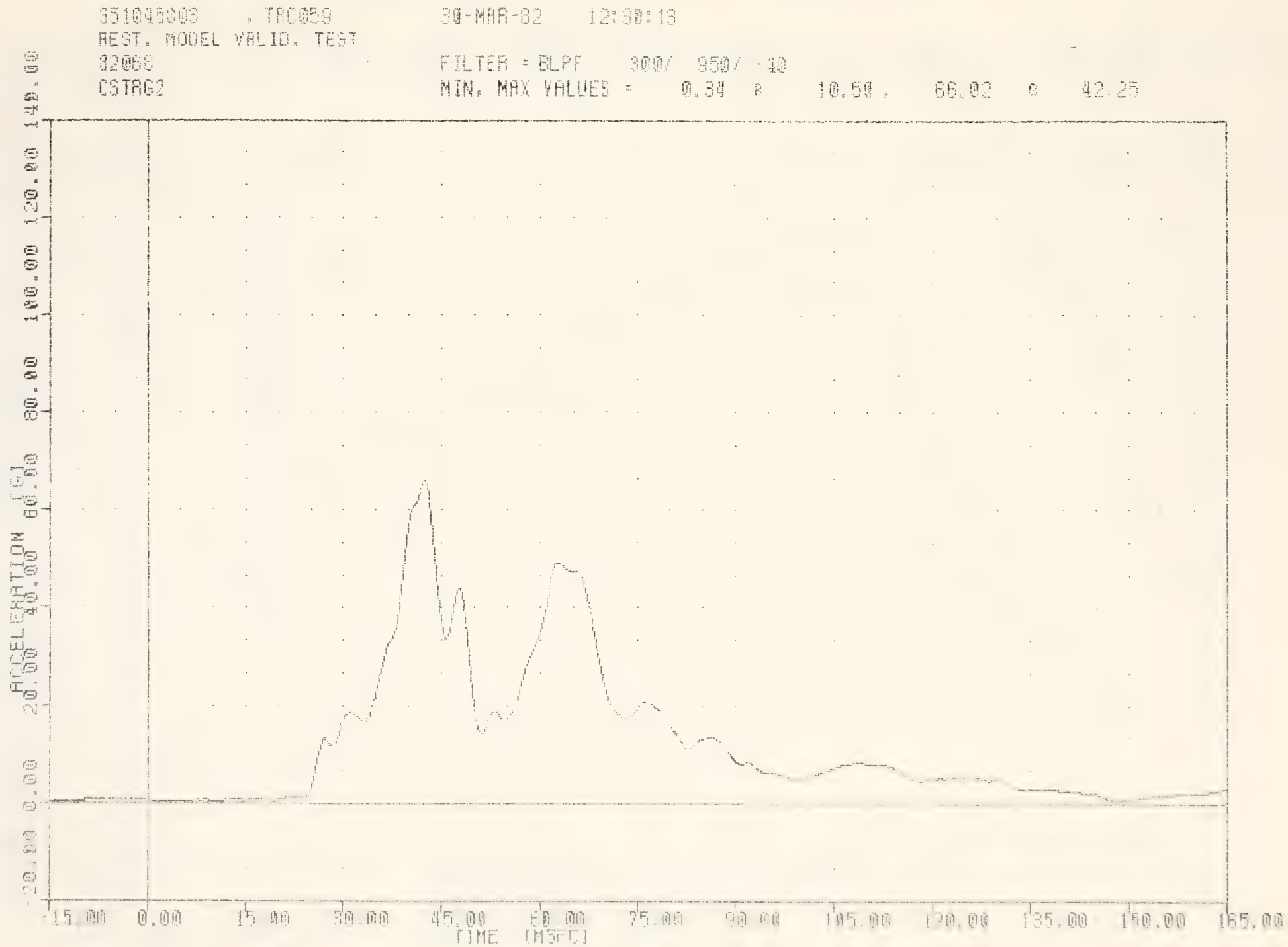
S51045003 , TRC059 30-MAR-82 12:30:13
REST. MODEL VALID. TEST
82088 FILTER = BLPF 300/ 950/ -40
CSTY62 MIN. MAX VALUES = -13.39 @ 56.75 , 11.97 @ 47.00



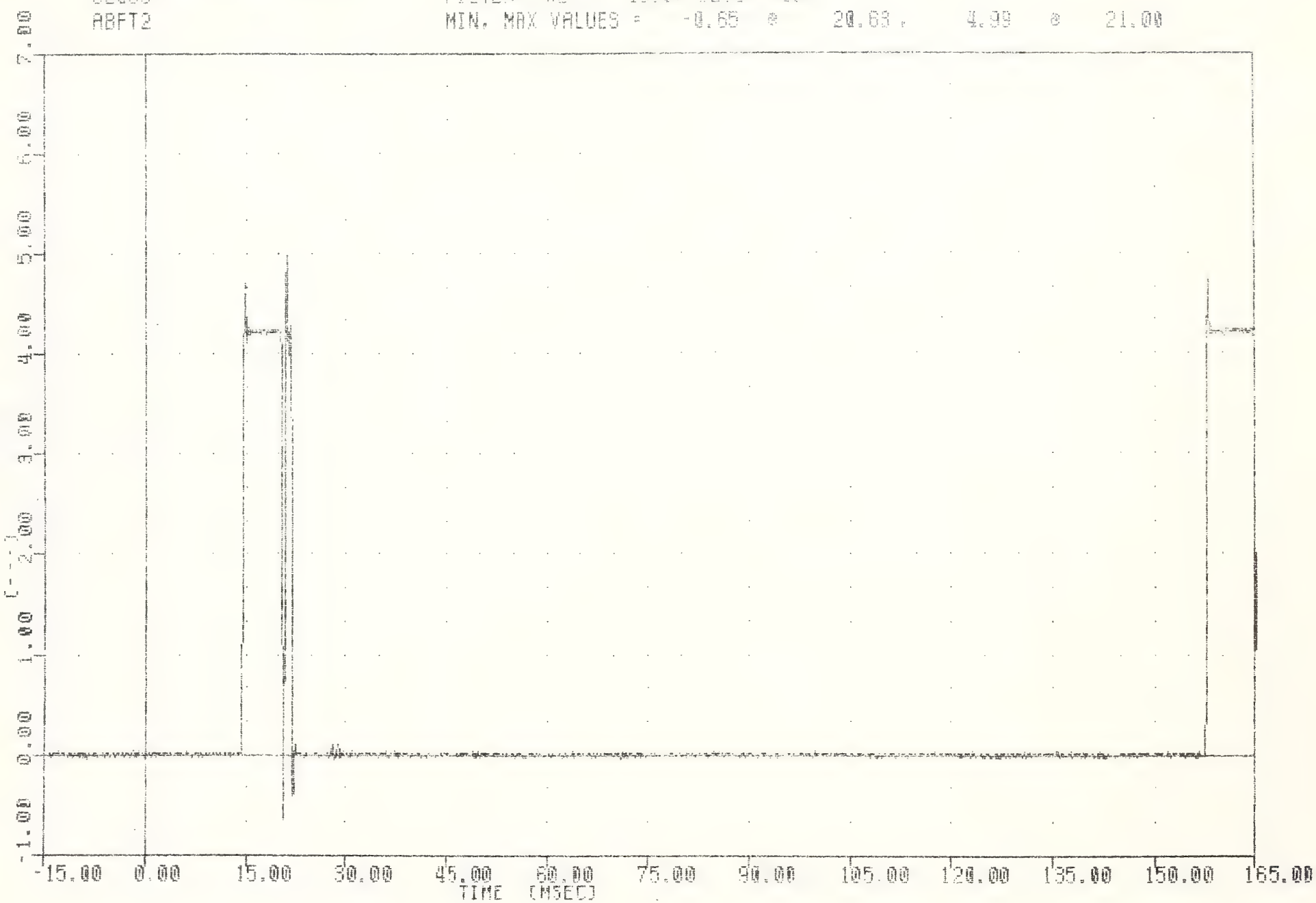
CHEST ACCELERATION X AXIS PASSENGER



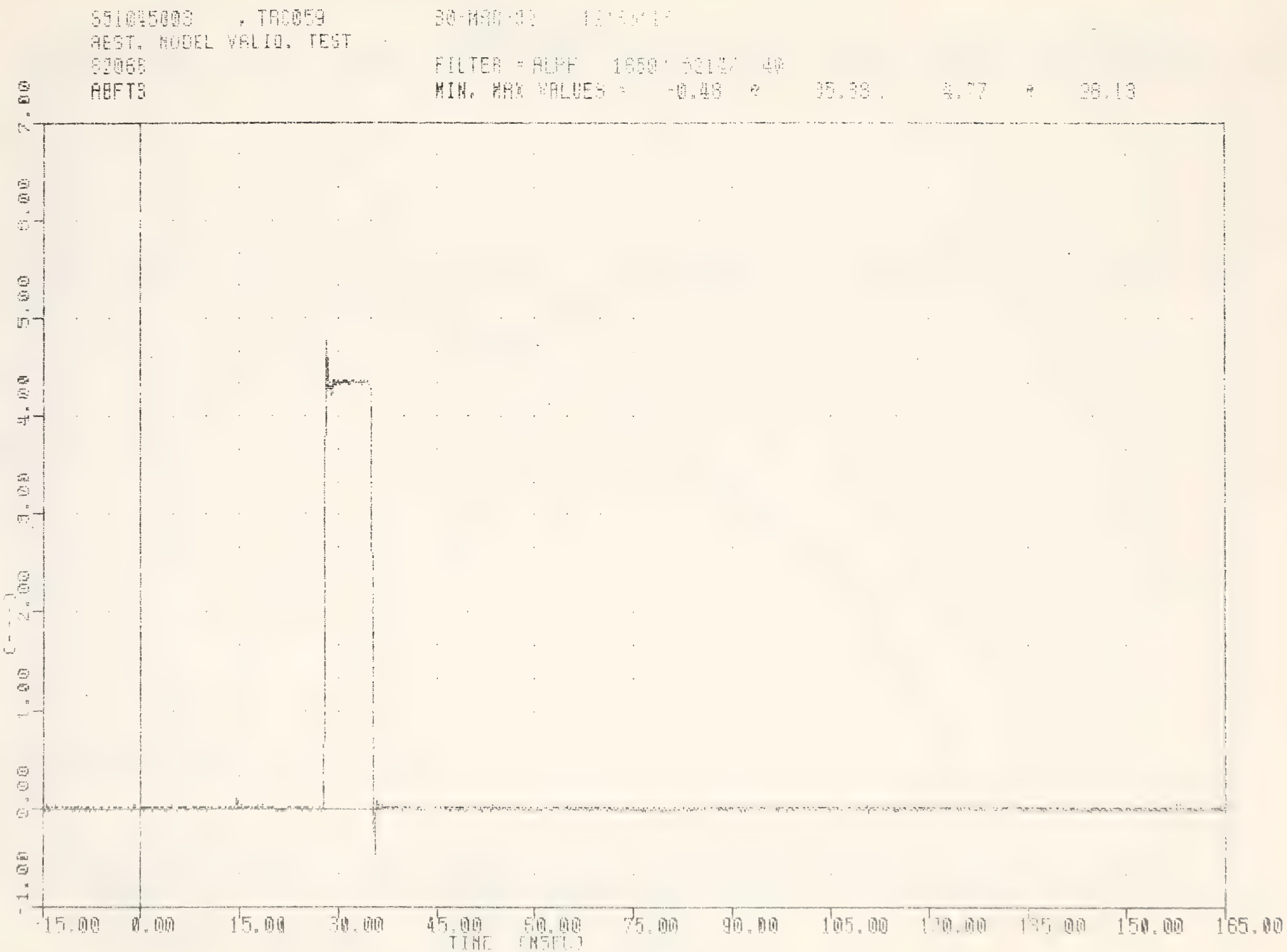
CHEST ACCELERATION Z AXIS PASSENGER



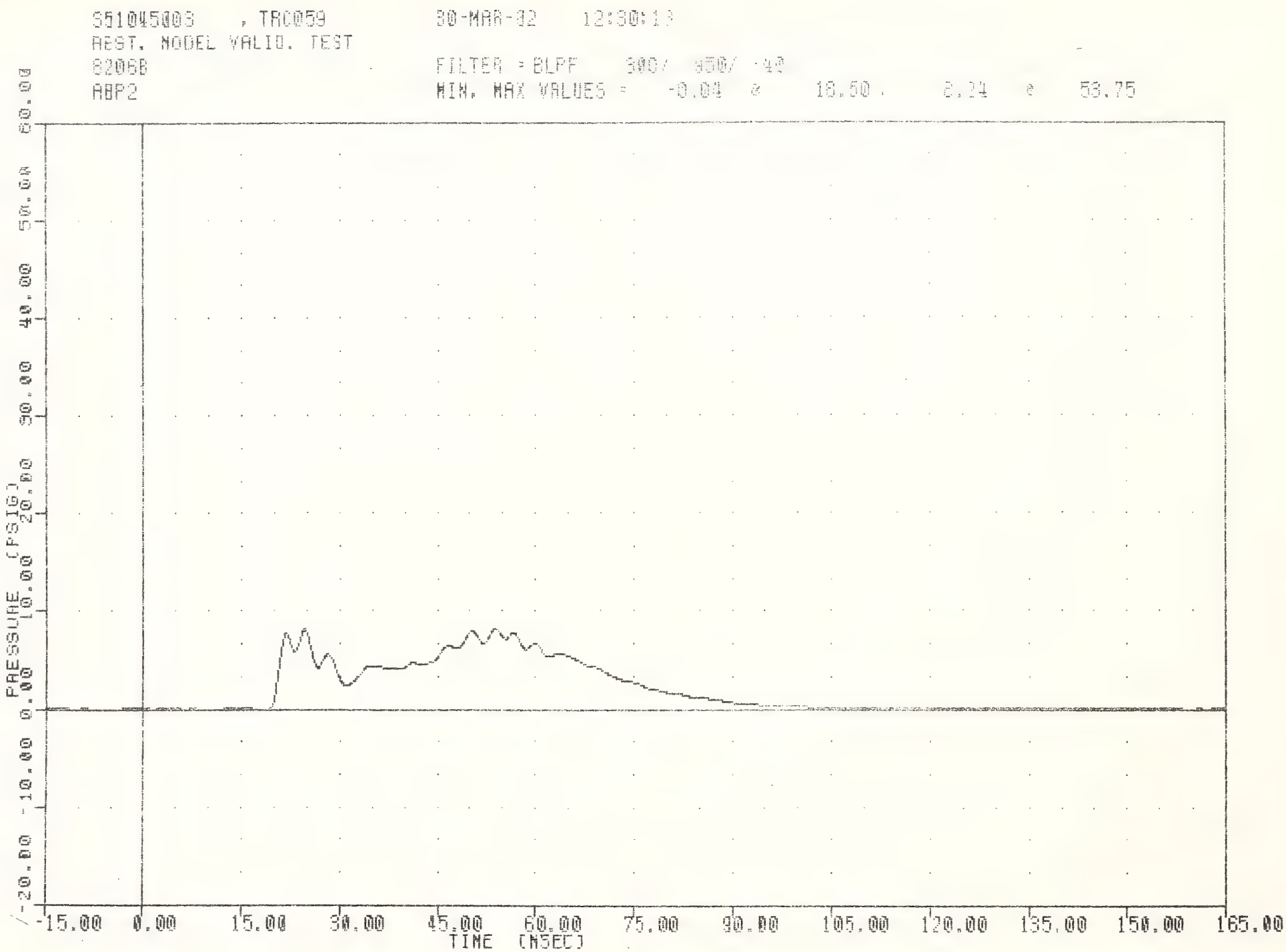
CHEST ACCELERATION DESWIFONT PASSENGER



AIR BAG FIRING EVENT PASSENGER

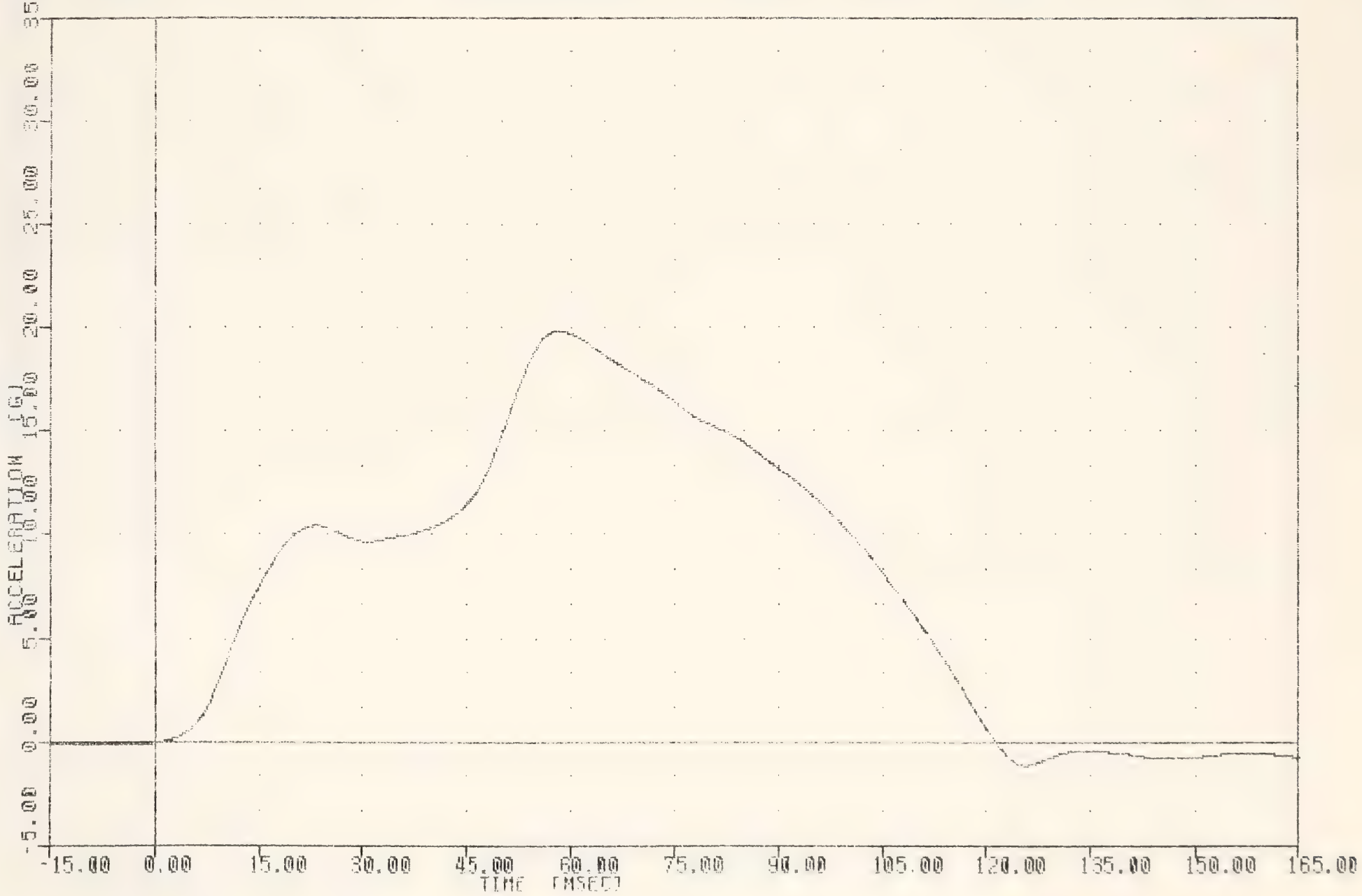


AIR BAG FIRING EVENT 3

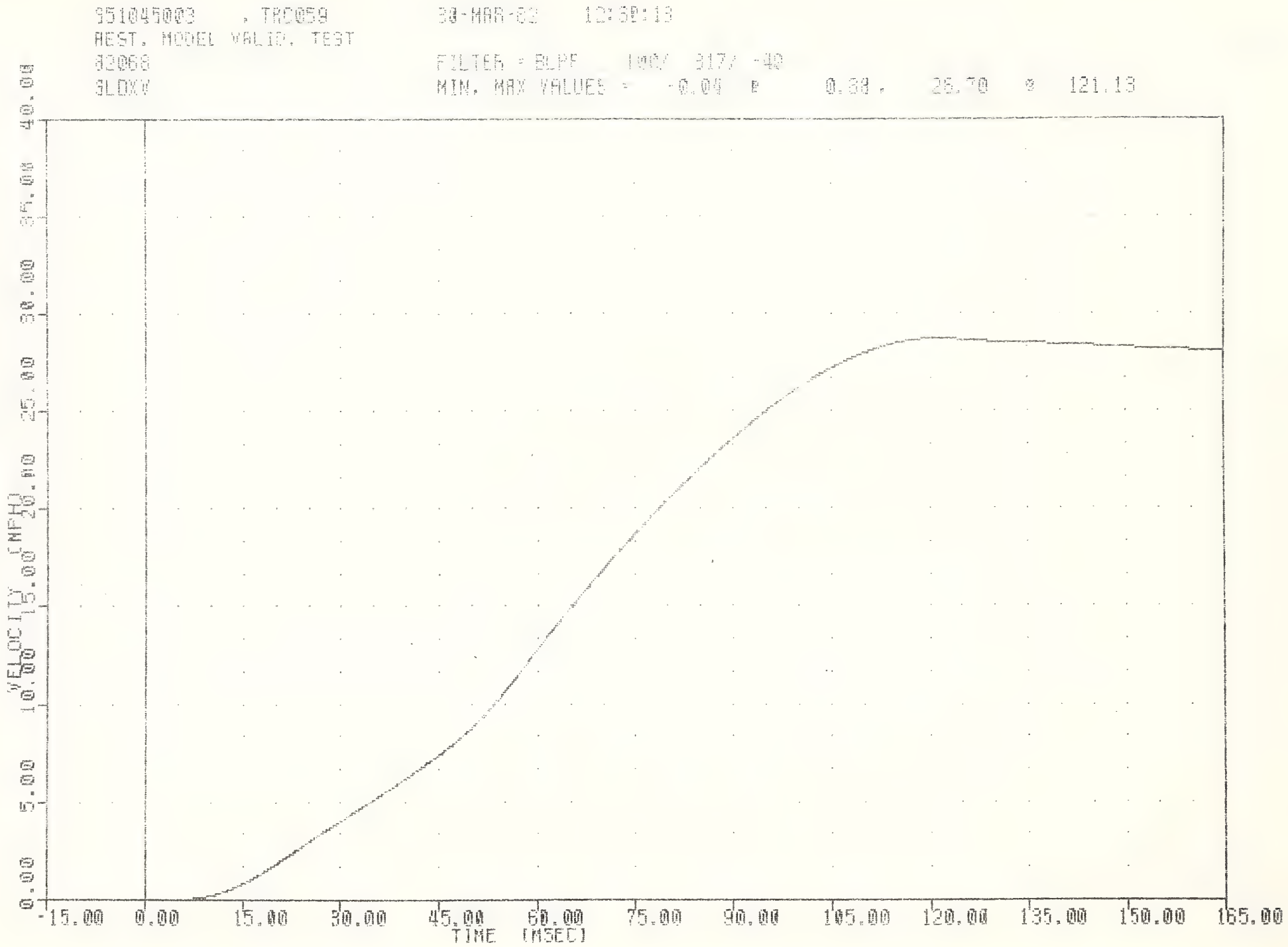


AIR BAG PRESSURE PASSENGER

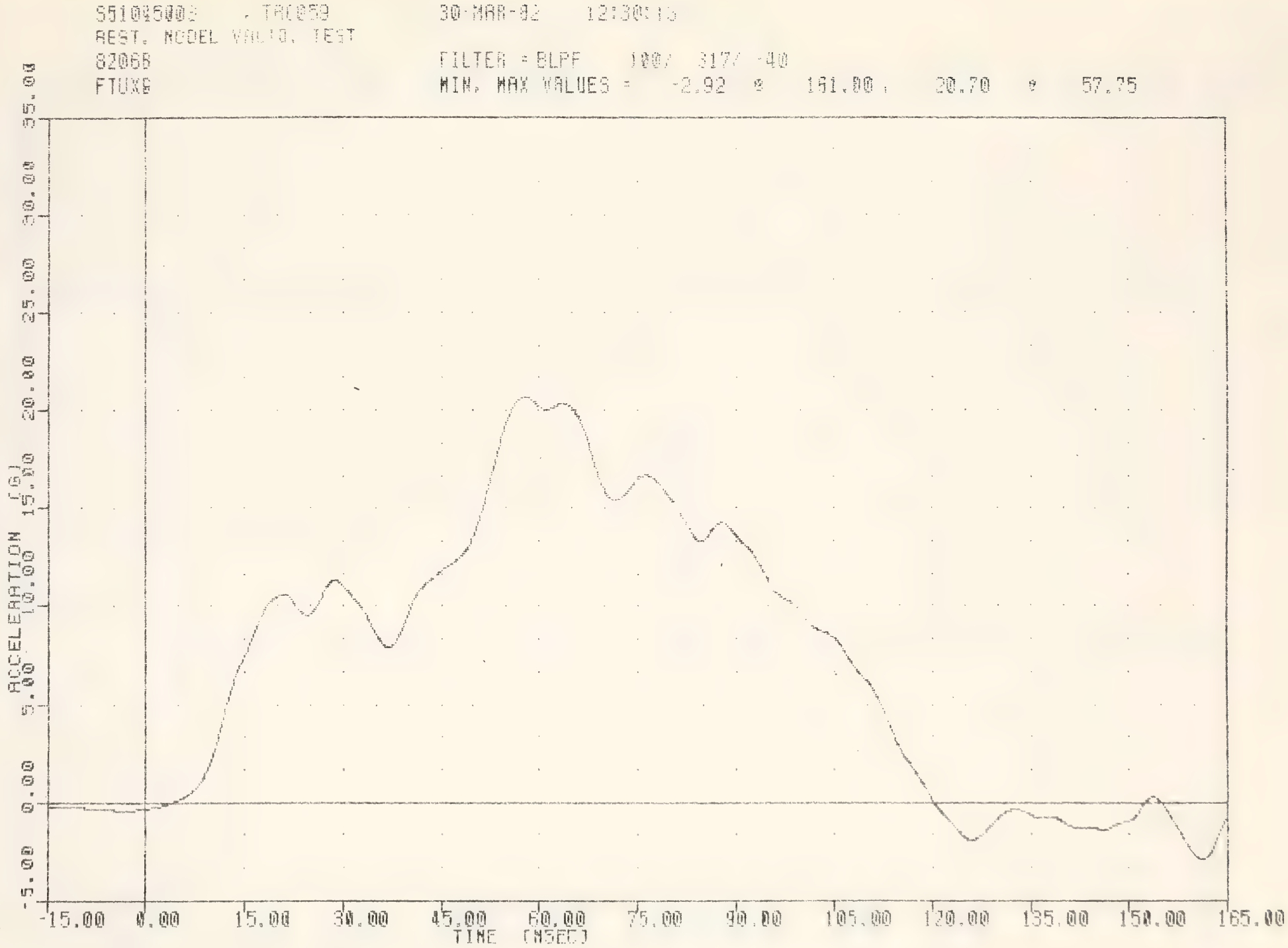
S51045003 , TRC059 30-MAR-82 12:30:13
REST. MODEL VALID. TFG1
82008 FILTER = BLPF 100/ 317/ -40
SLDXG MIN, MAX VALUES = -1.15 @ 125.85 , 19.82 @ 58.13



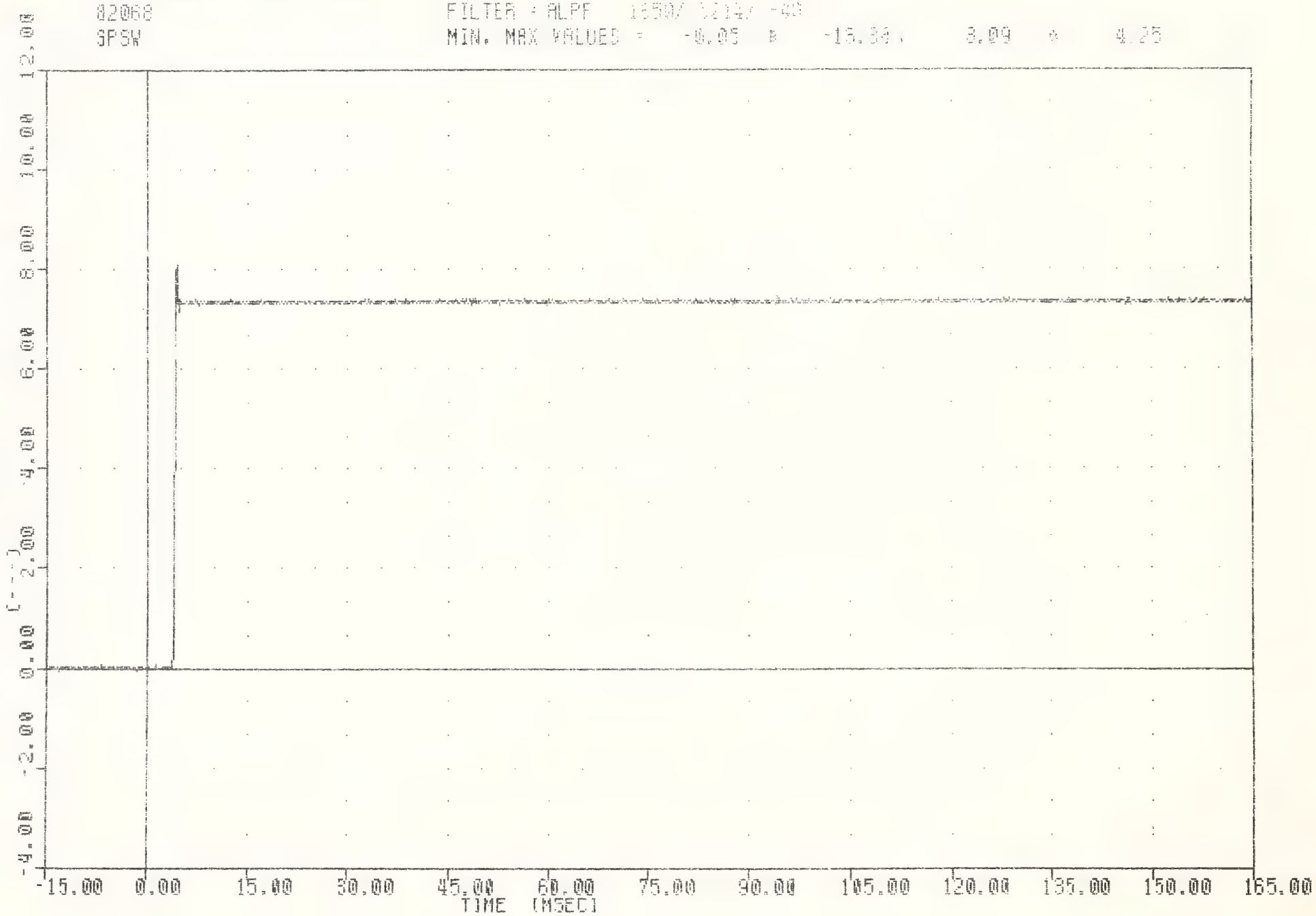
SLED ACCELERATION



SLED VELOCITY IN MPH



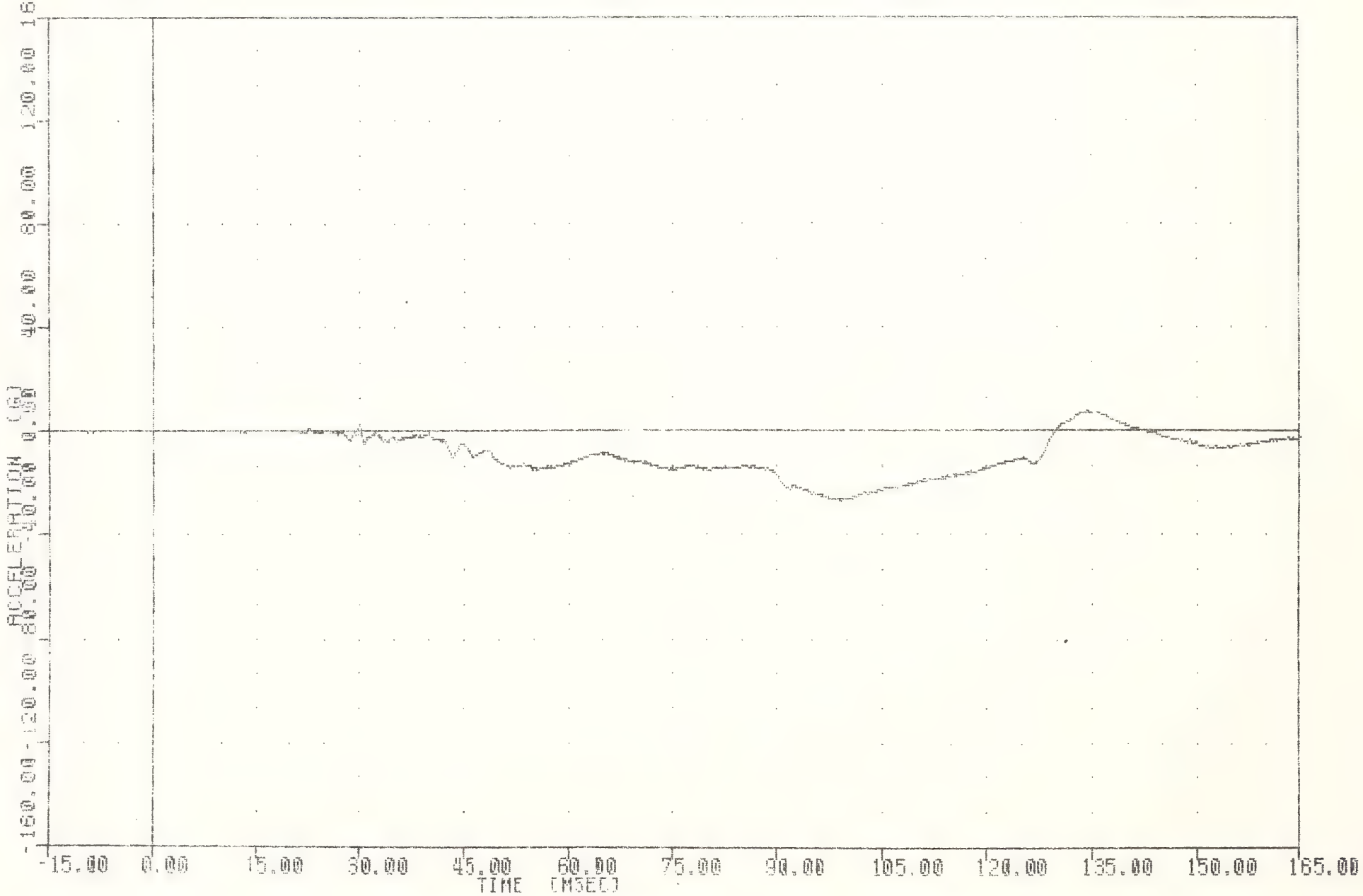
FLOOR PAN TUNNEL ACCELERATION



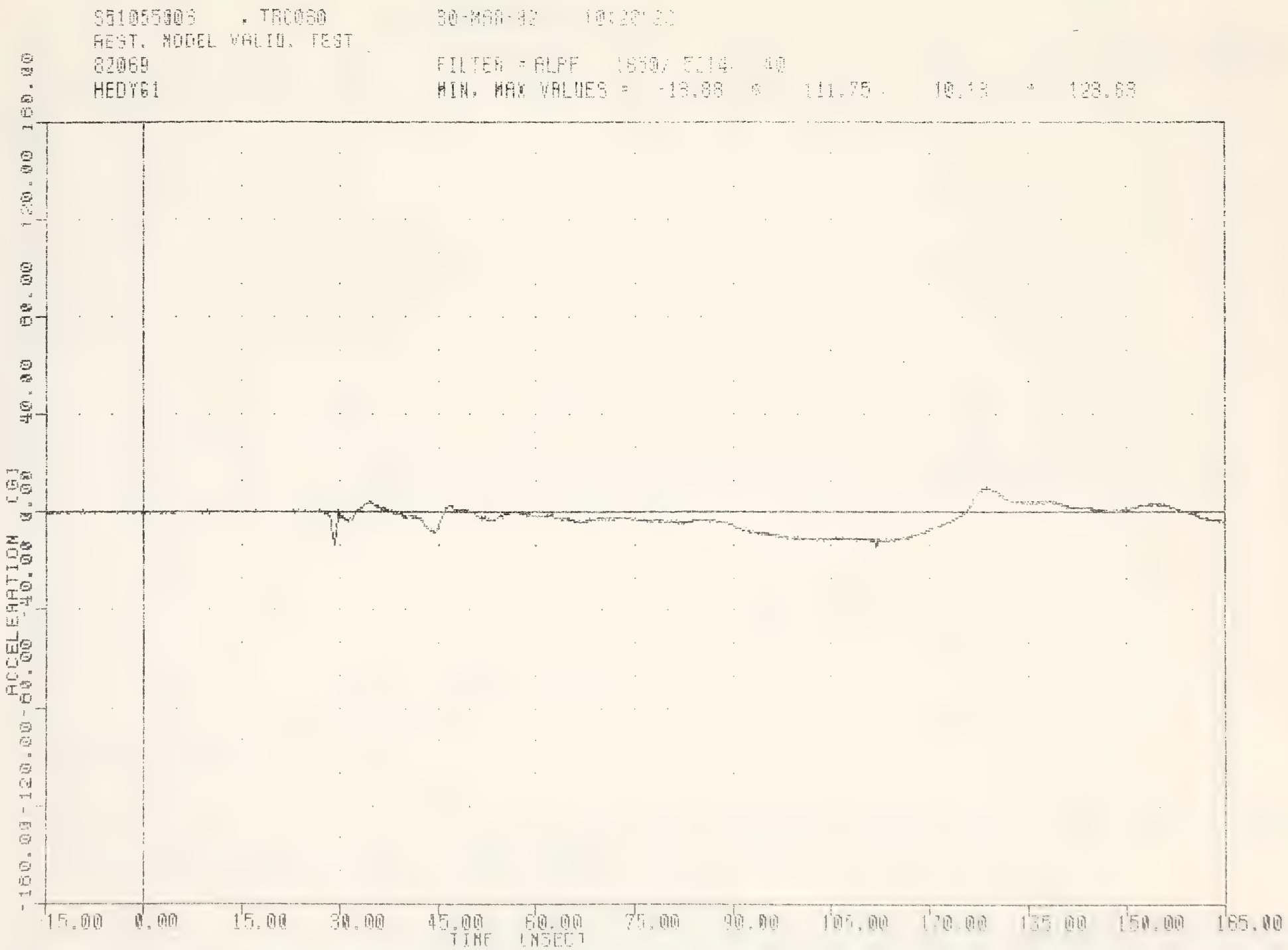
SLED POSITION SWITCH

TEST NO. 5

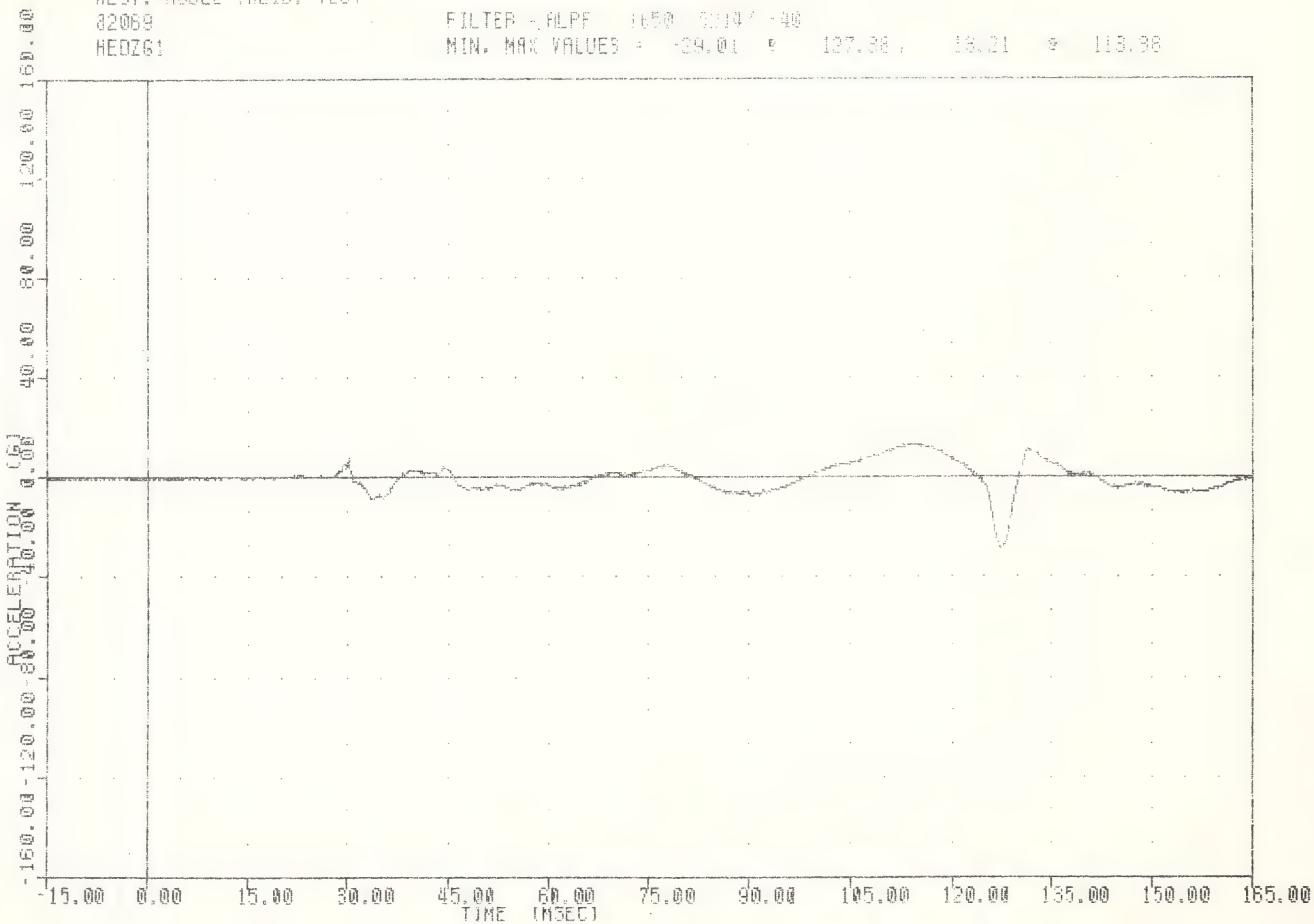
S5105500B3 . TRC060 30-MAR-82 10:20:2[illegible]
BEST. MODEL VALID. TEST
82069 FILTER = ALPF 1650/ 5214/ -40
HEOXG1 MIN, MAX VALUES = -26.63 @ 99.00 , 7.56 @ 134.25



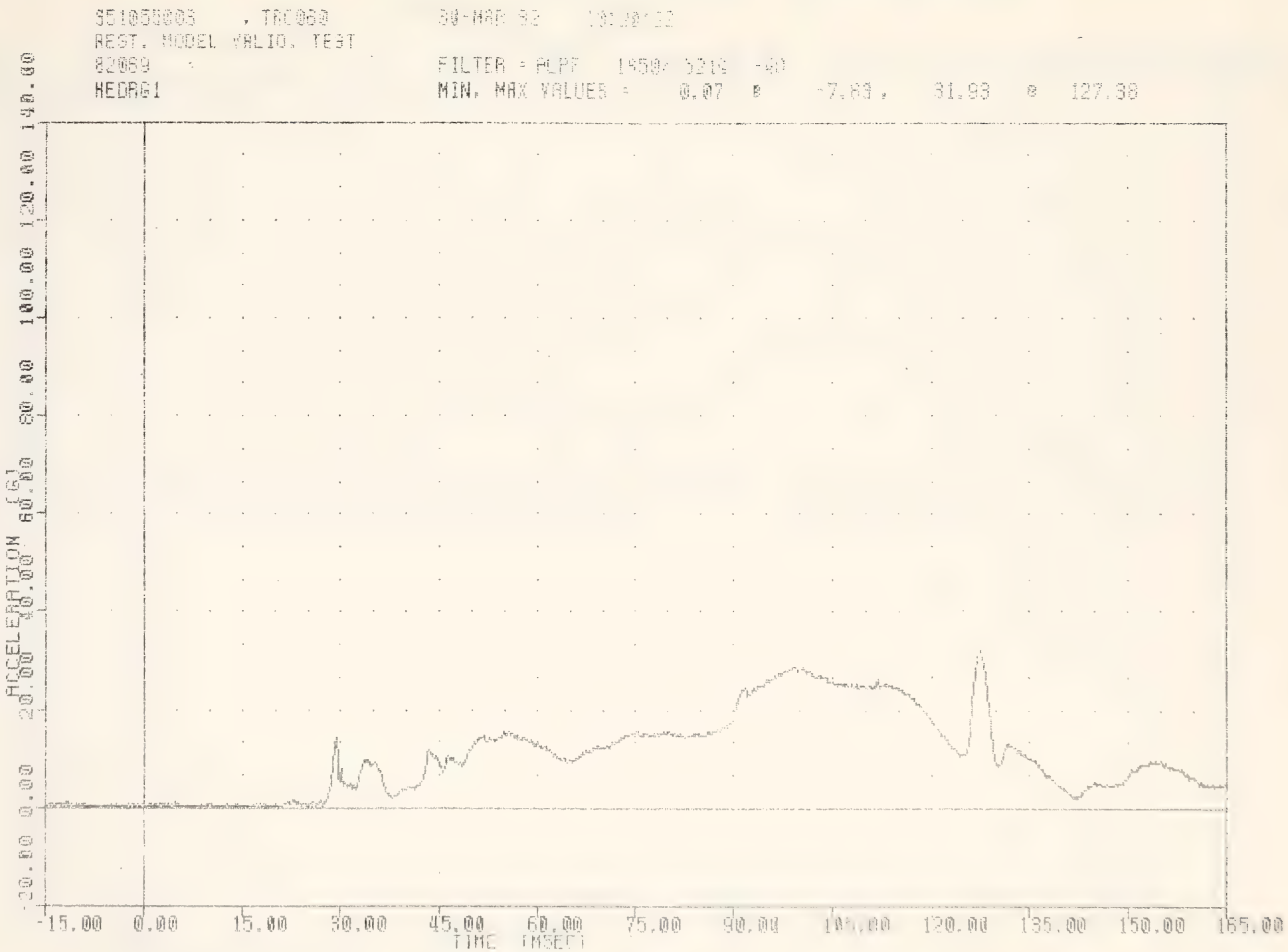
HEAD ACCELERATION X AXIS DRIVER



HEAD ACCELERATION Y AXIS (DRIVER)

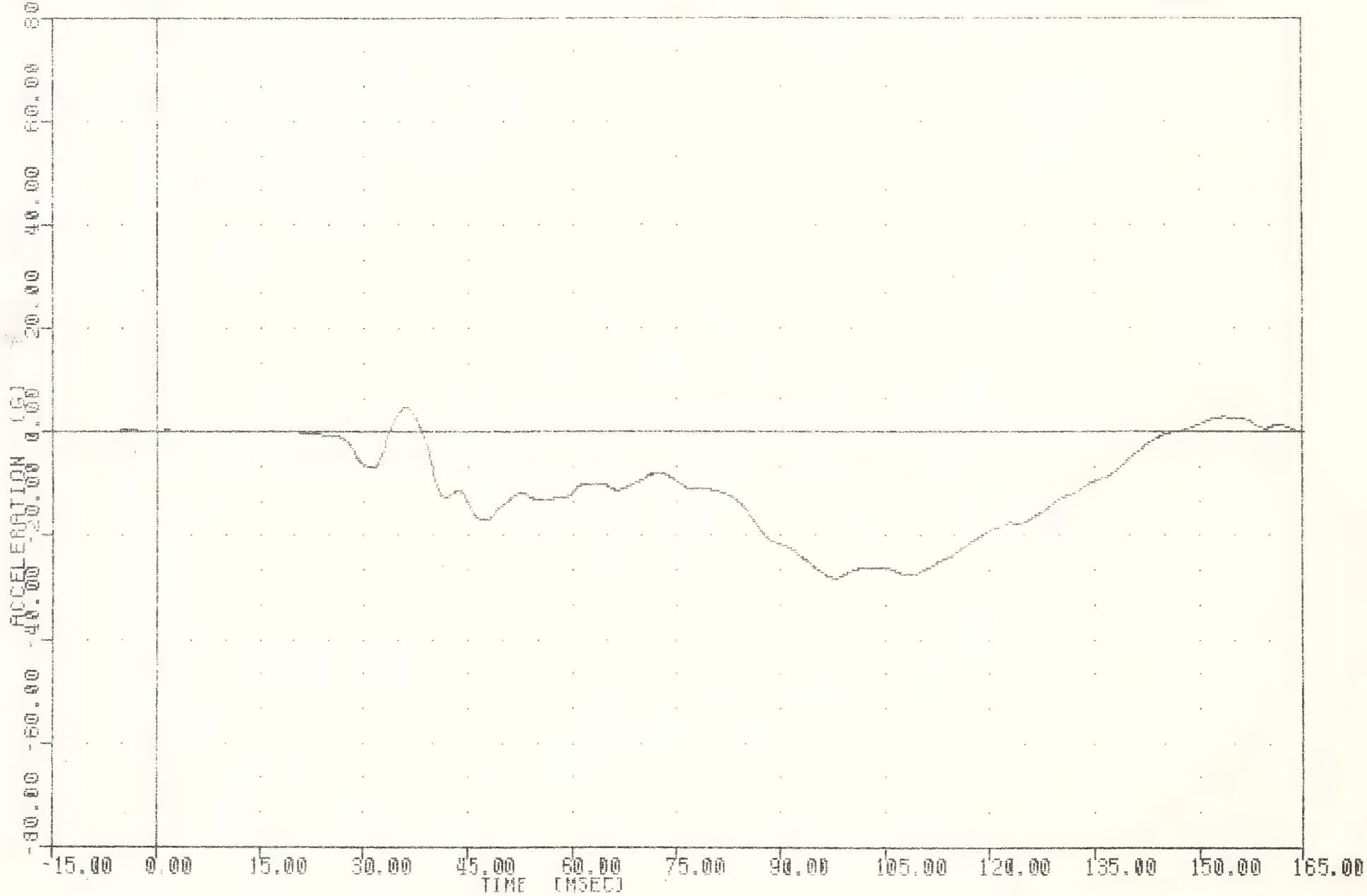


HEAD ACCELERATION Z AXIS DRIVER

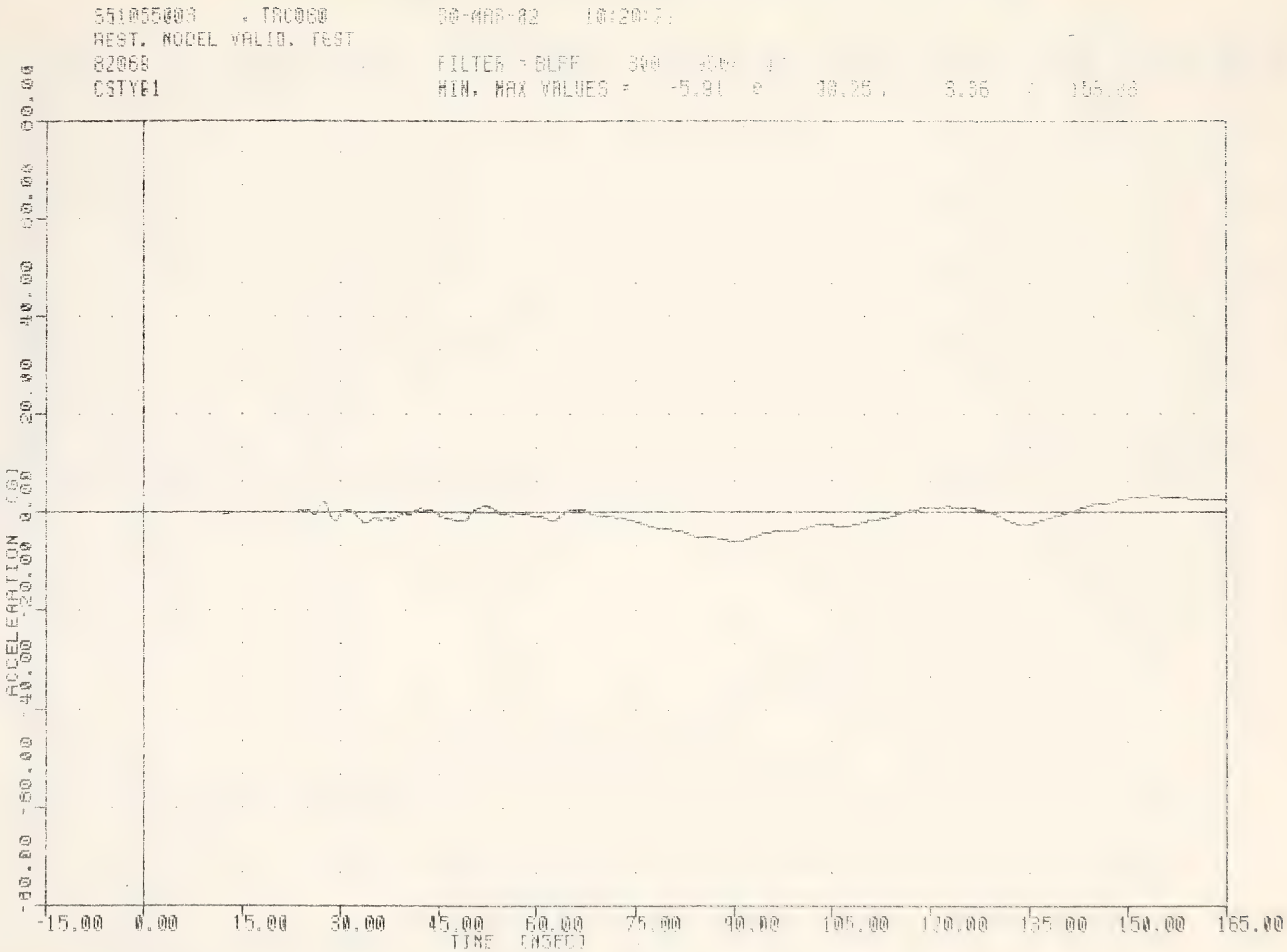


HEAD ACCELERATION IN ALTONE [illegible]

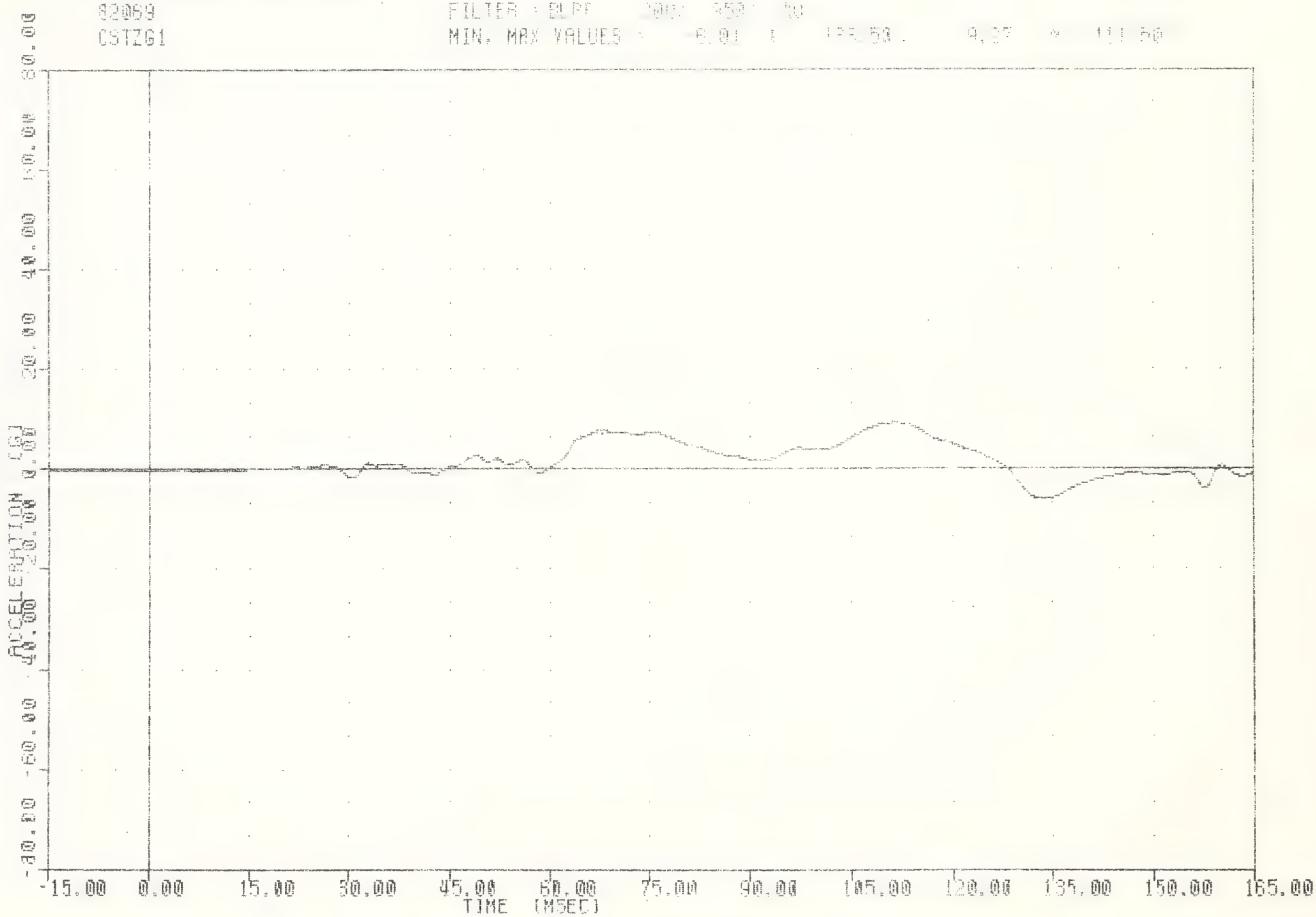
S510550003 , TRC060 30-MAR-85 16:30:32
REST. MODEL VALID. TEST
82063 FILTER = 6LPF 300/ 960/ -40
CSTXG1 MIN. MAX VALUES = -28.19 @ 97.75 , 4.78 @ 85.88



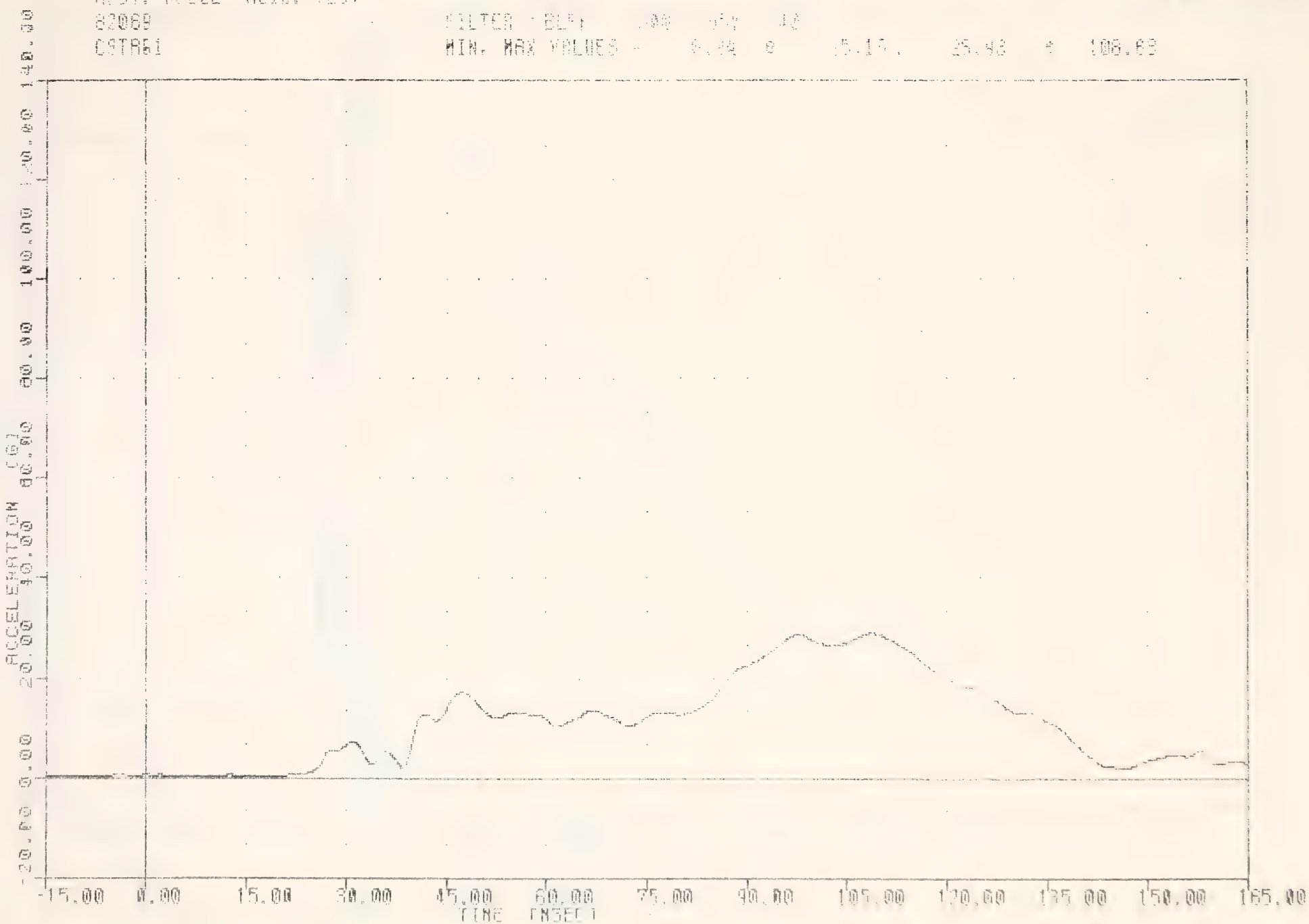
CHEST ACCELERATION X AXIS DRIVER

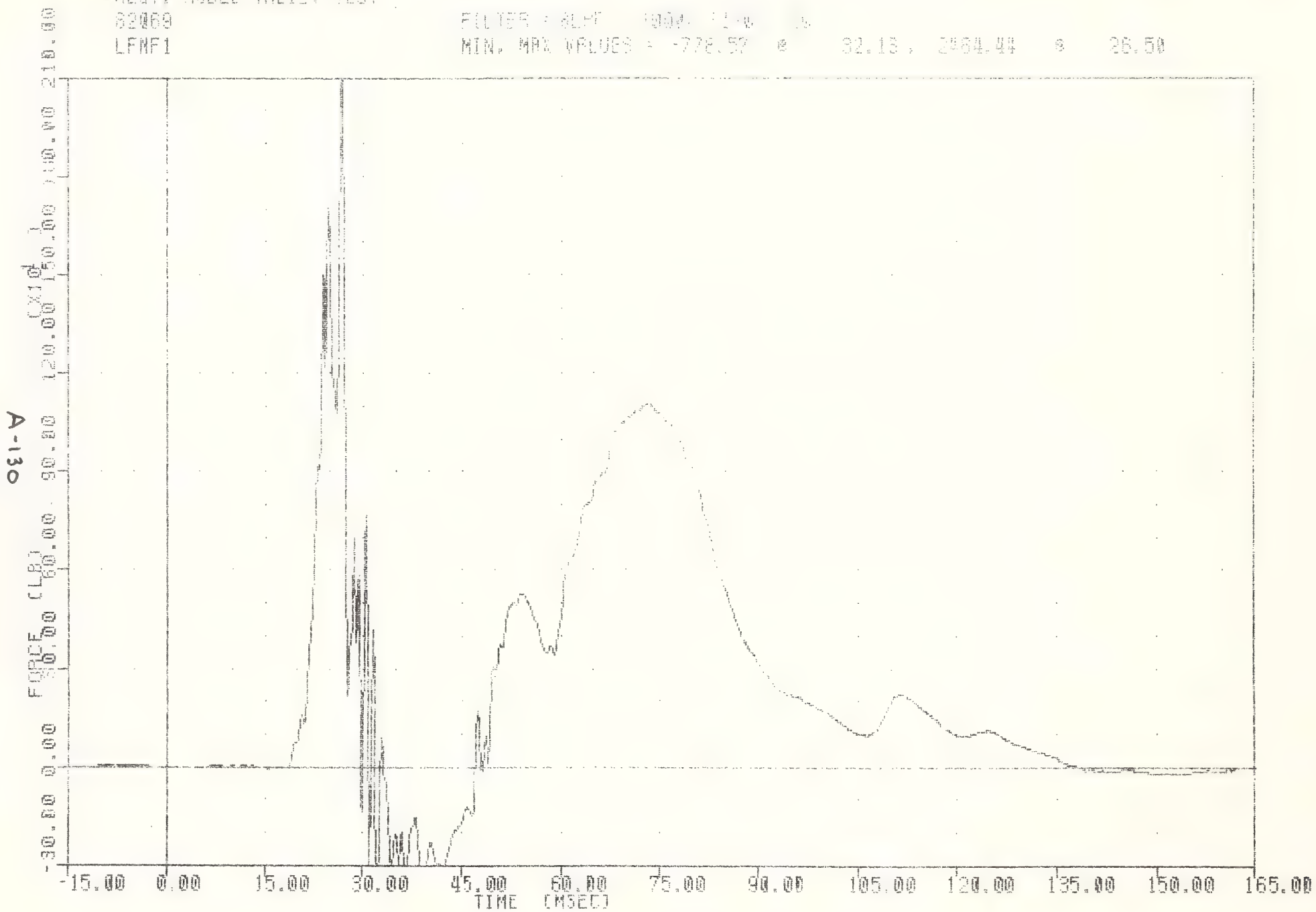


CHEST ACCELERATION - 1013 DRIVER

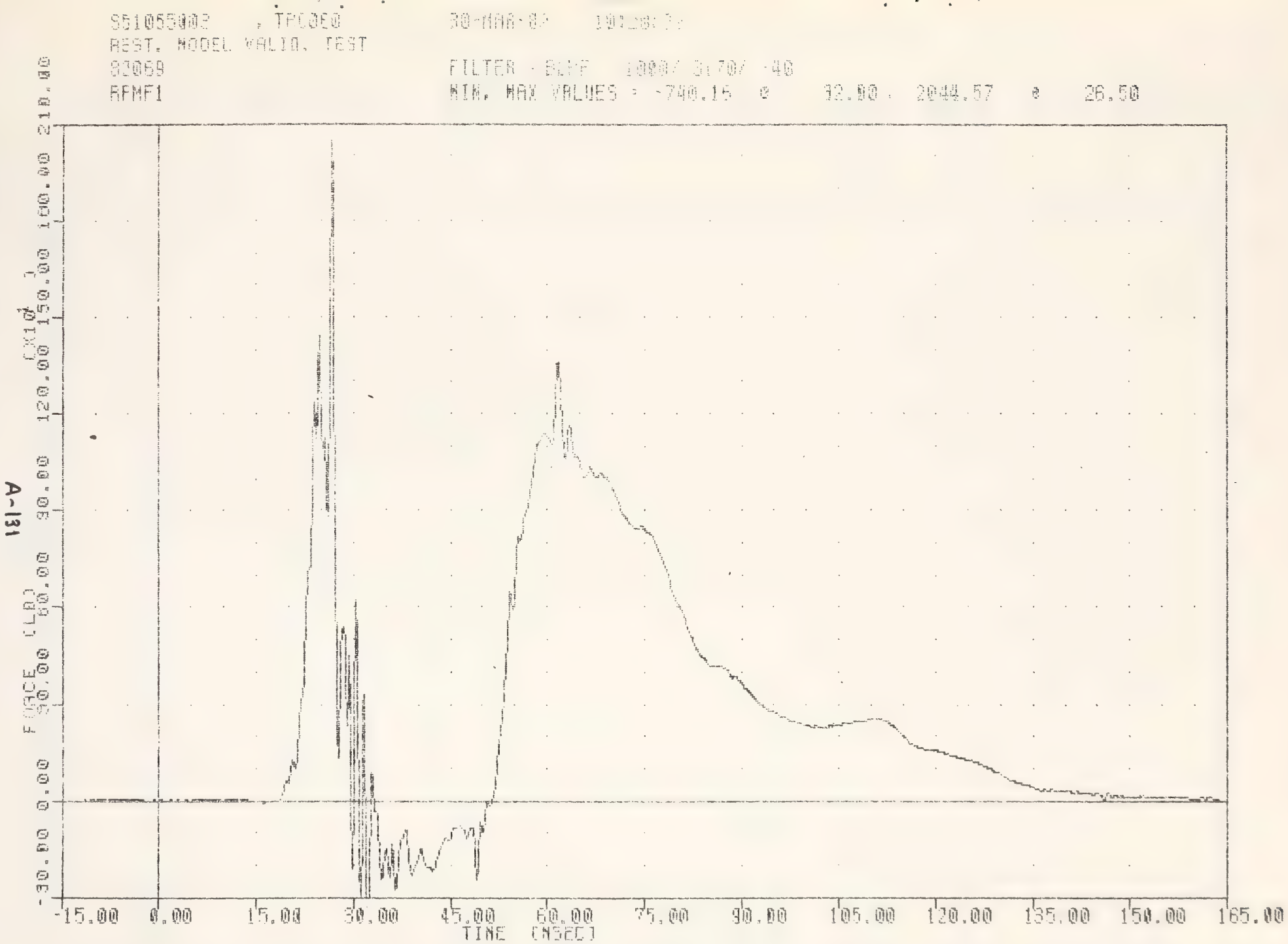


CHEST ACCELERATION Z AXIS DRIVER

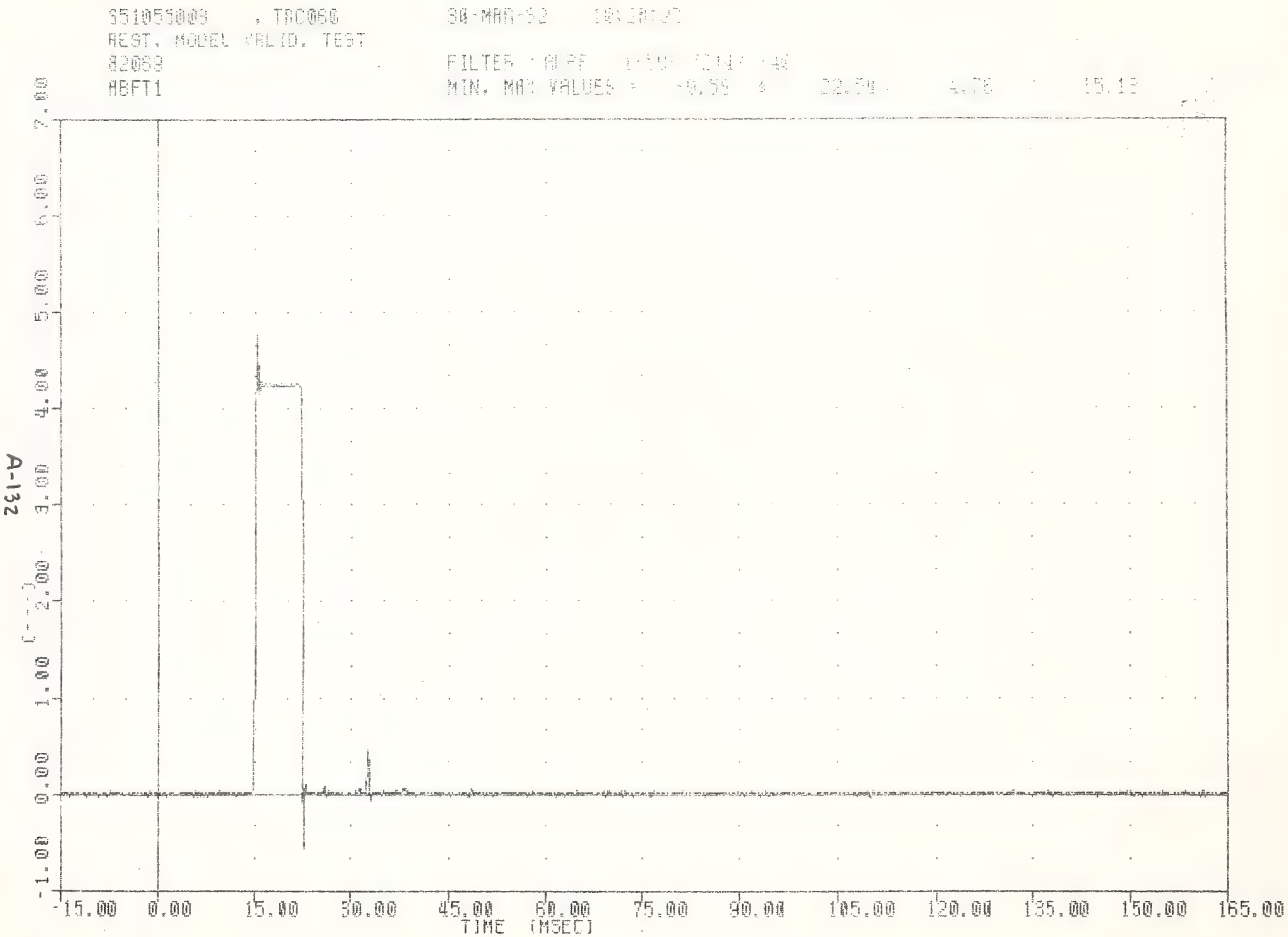

ACCELERATION (G)
TIME (MSEC)



LEFT FEMUR FORCE DRIVER

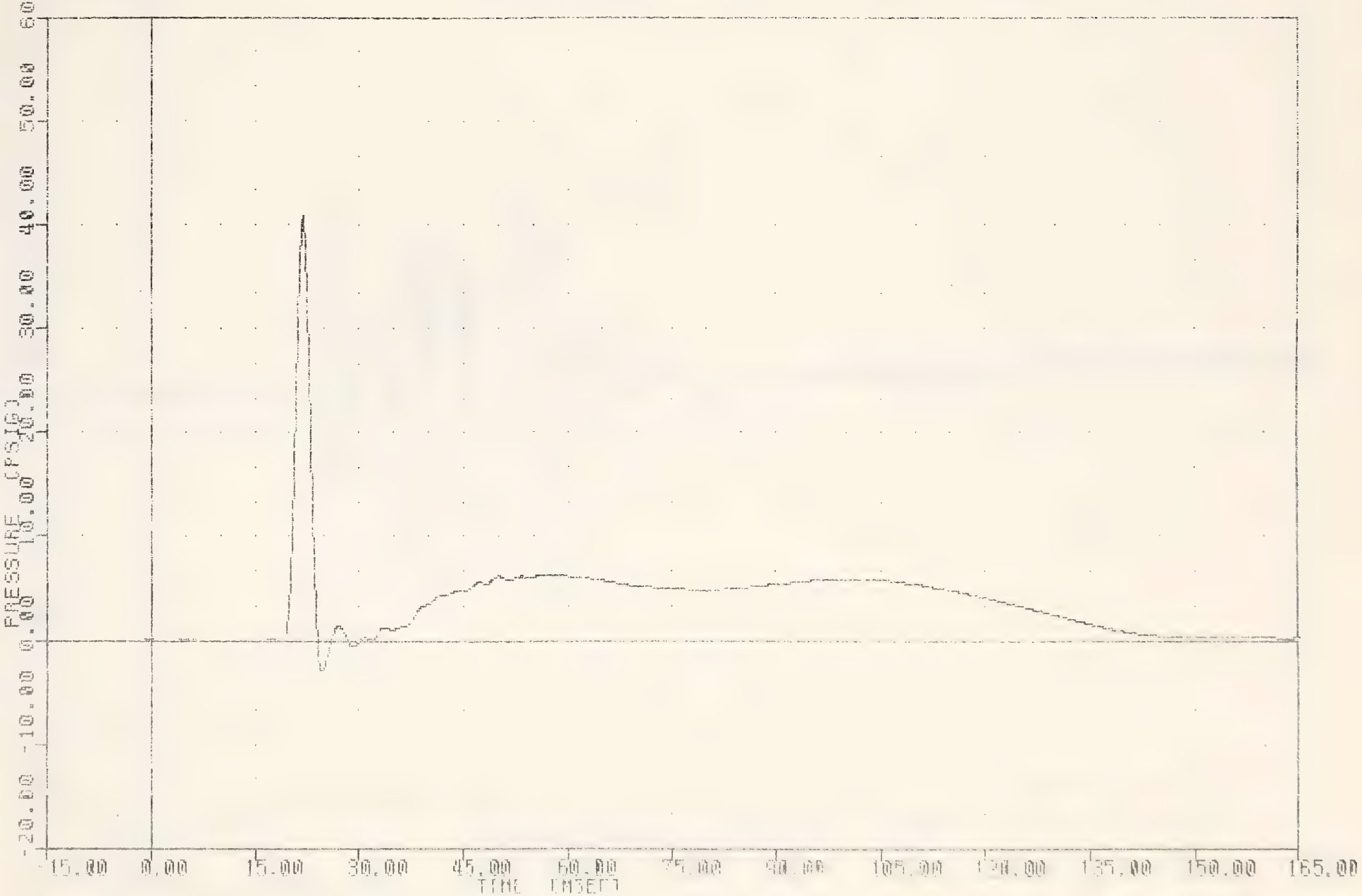


RIGHT FEMUR FORCE DRIVER



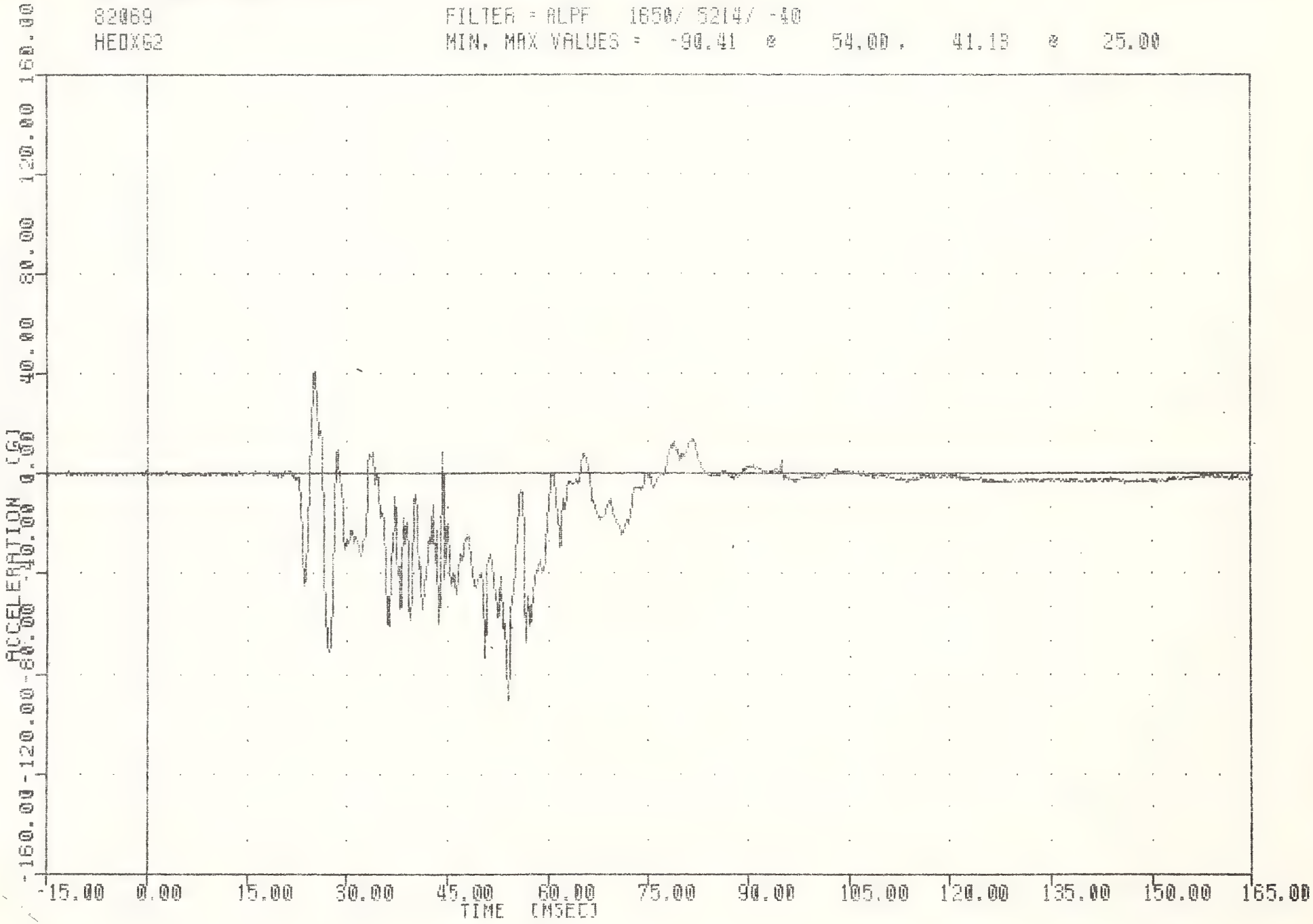
AIR BAG FIRING EVENT DRIVER

S51055003 , TRC660 30-MAR-81 10:30:21
AEST, MODEL VALID. TEST
82069 FILTER = BLPF 300, 950, -48
ABP1 MIN. MAX VALUES = 2.98 @ 20.53, 40.81 @ 21.75

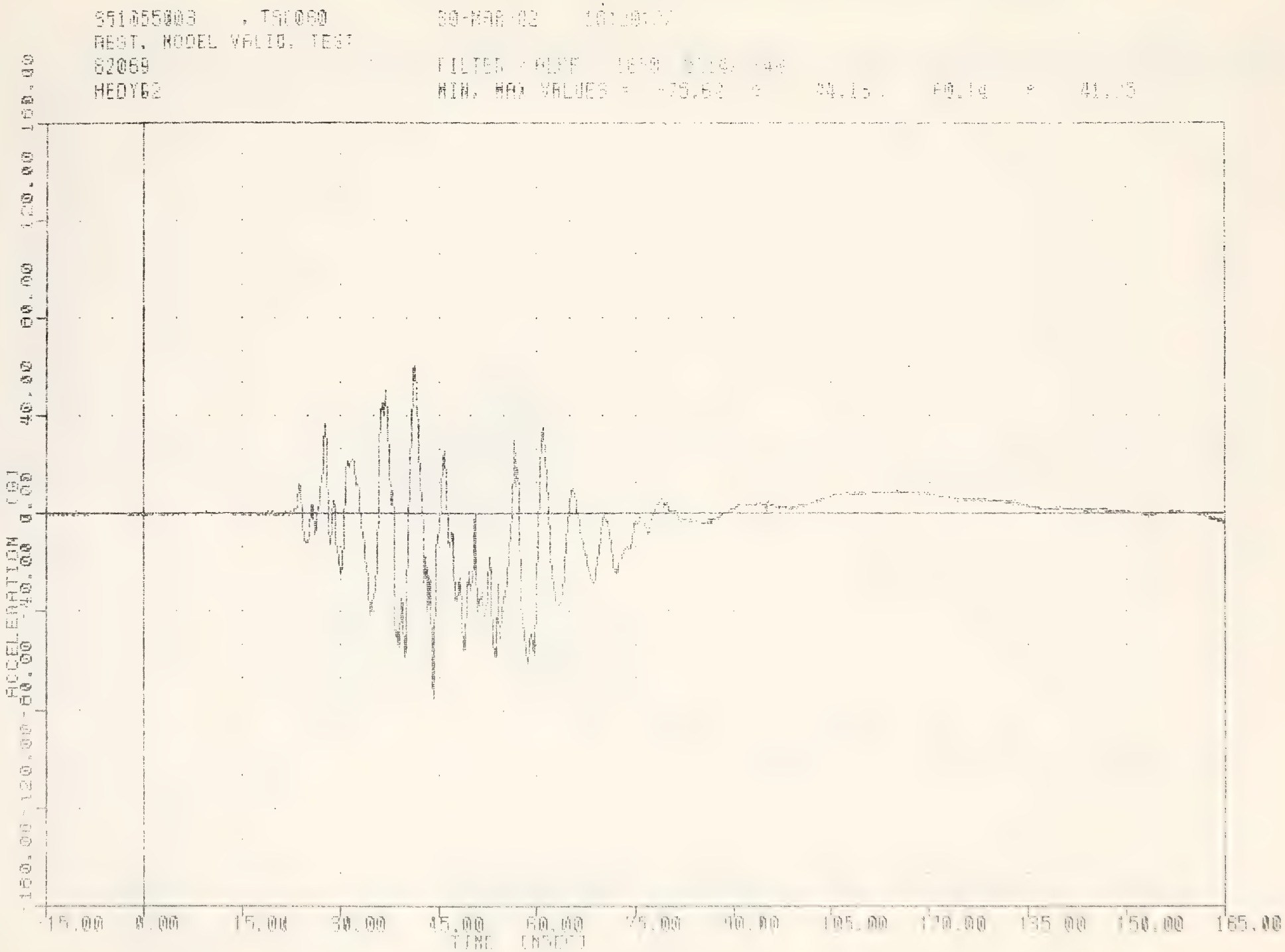


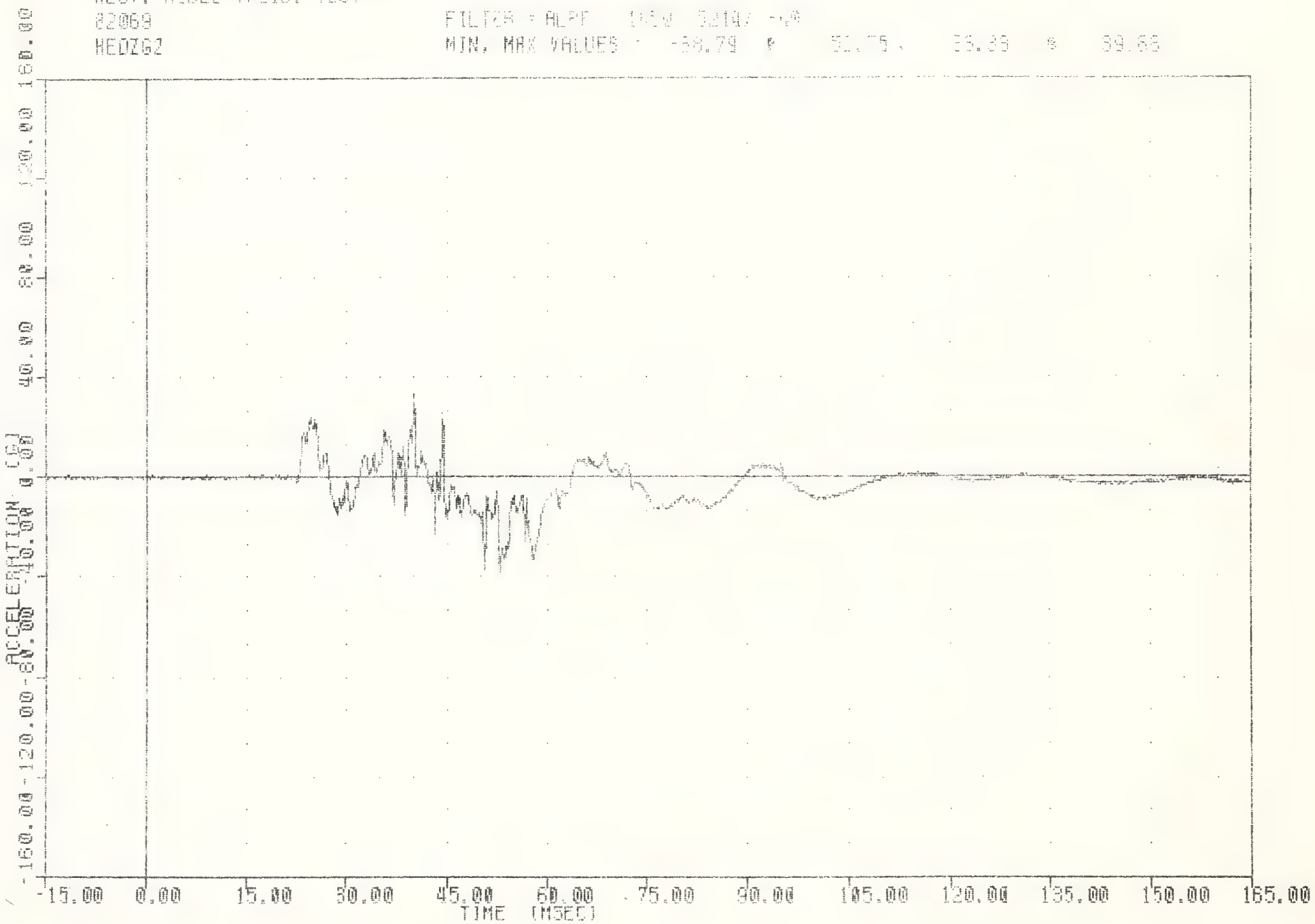
AIR BAG PRESSURE DATA

S51055003 , TRC060 30-MAR-82 10:20:22
REST. MODEL VALID. TEST
82069 FILTER = ALPF 1650/ 5214/ -40
HEDXG2 MIN, MAX VALUES = -90.41 @ 54.00 , 41.13 @ 25.00

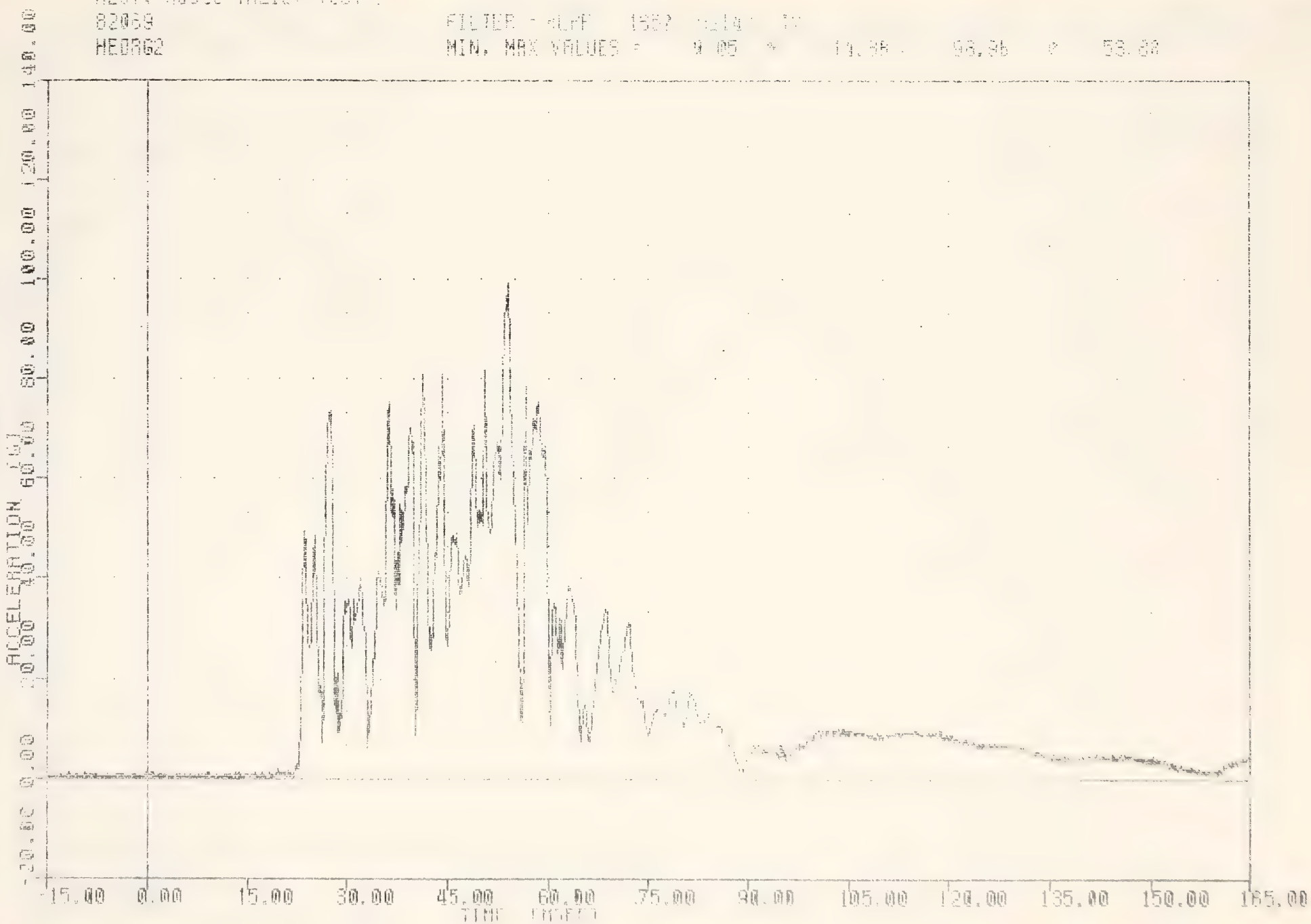


HEAD ACCELERATION X AXIS PASSENGER

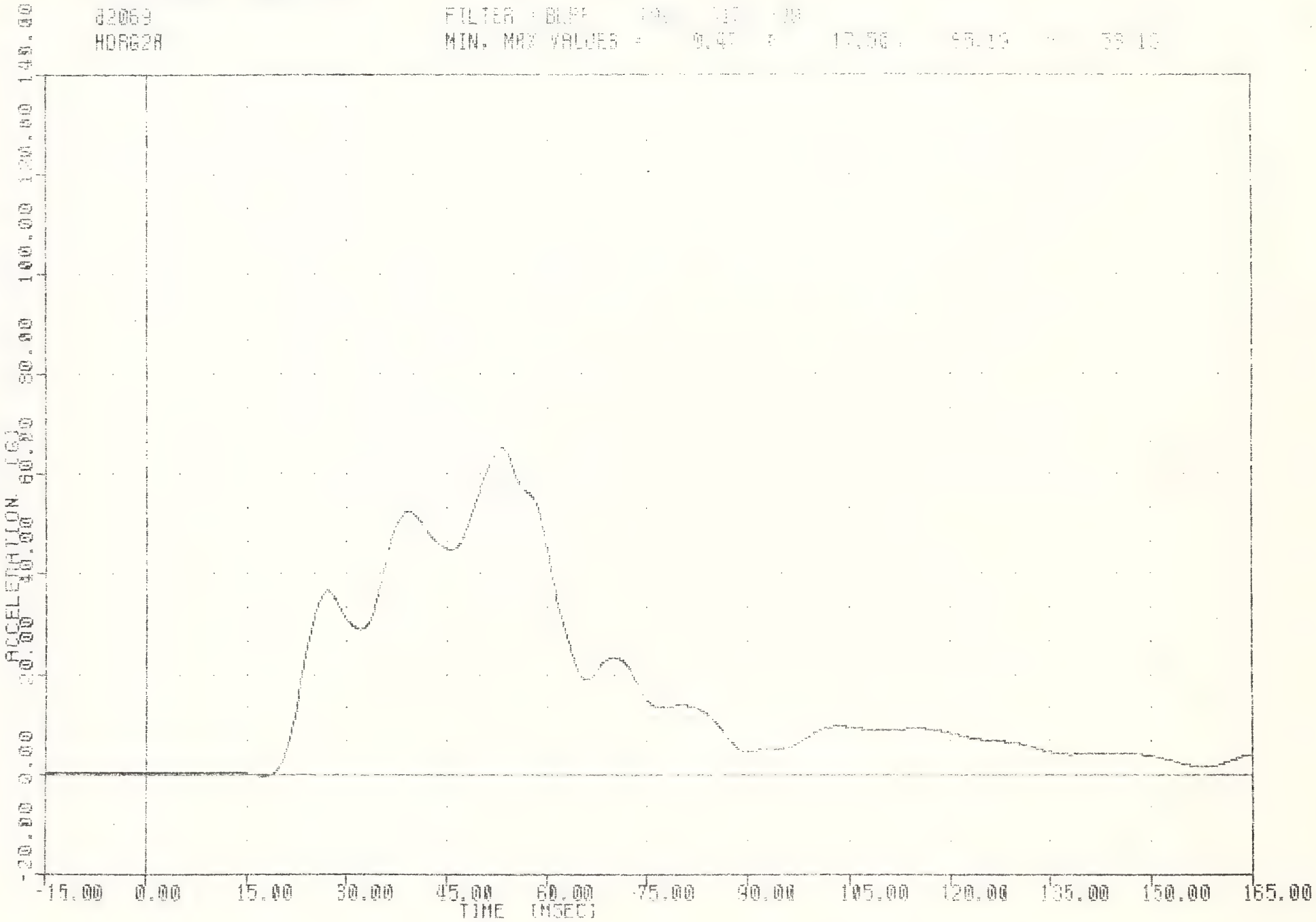

551055003 , TSC080
REST. MODEL VALID. TEST
82059
HEDY62
30-MAR-82
FILTER : ALPF
MIN, MAX VALUES =
ACCELERATION (G)
TIME (MSEC)



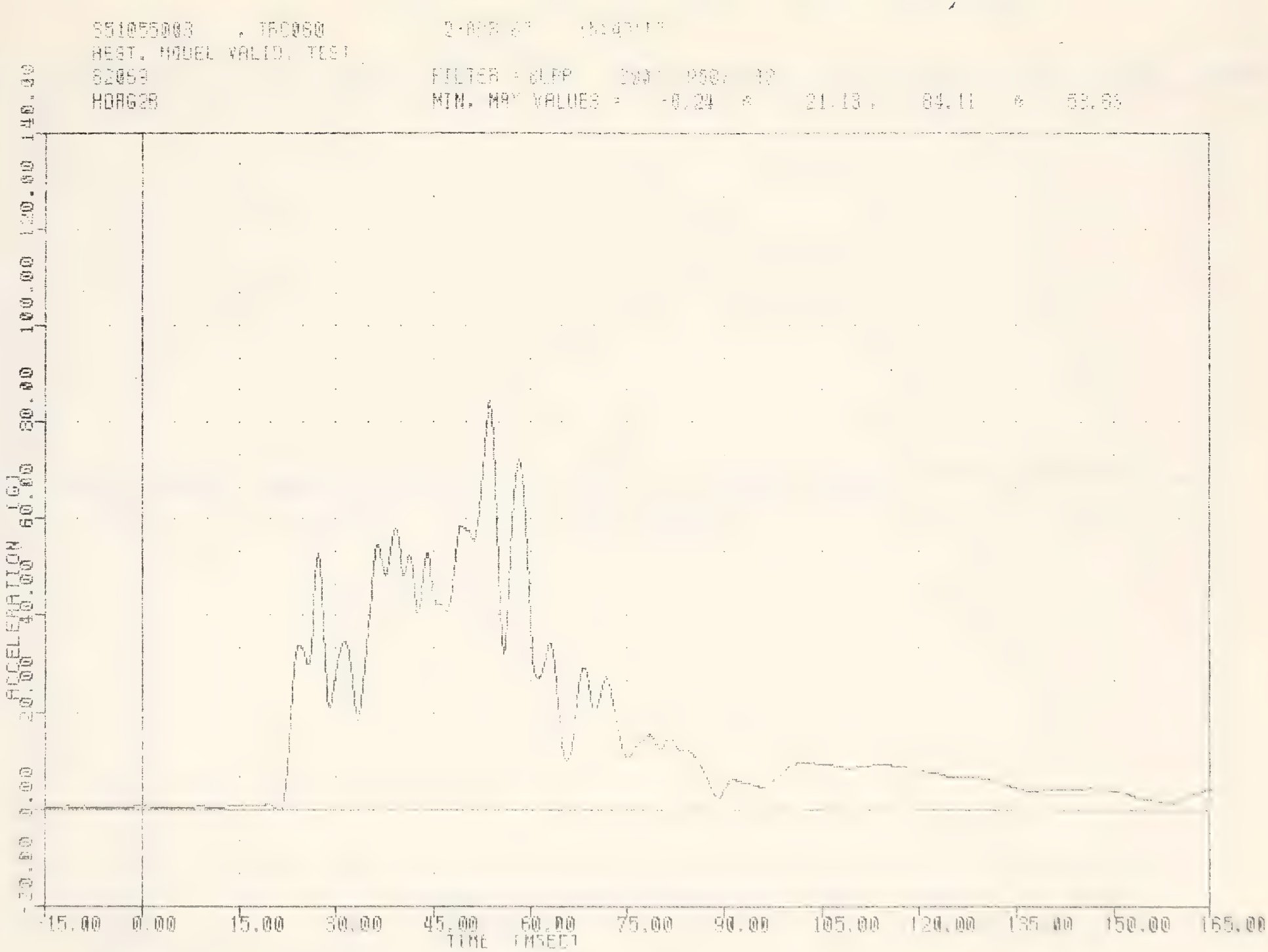
HEAD ACCELERATION Z AXIS PASSENGER



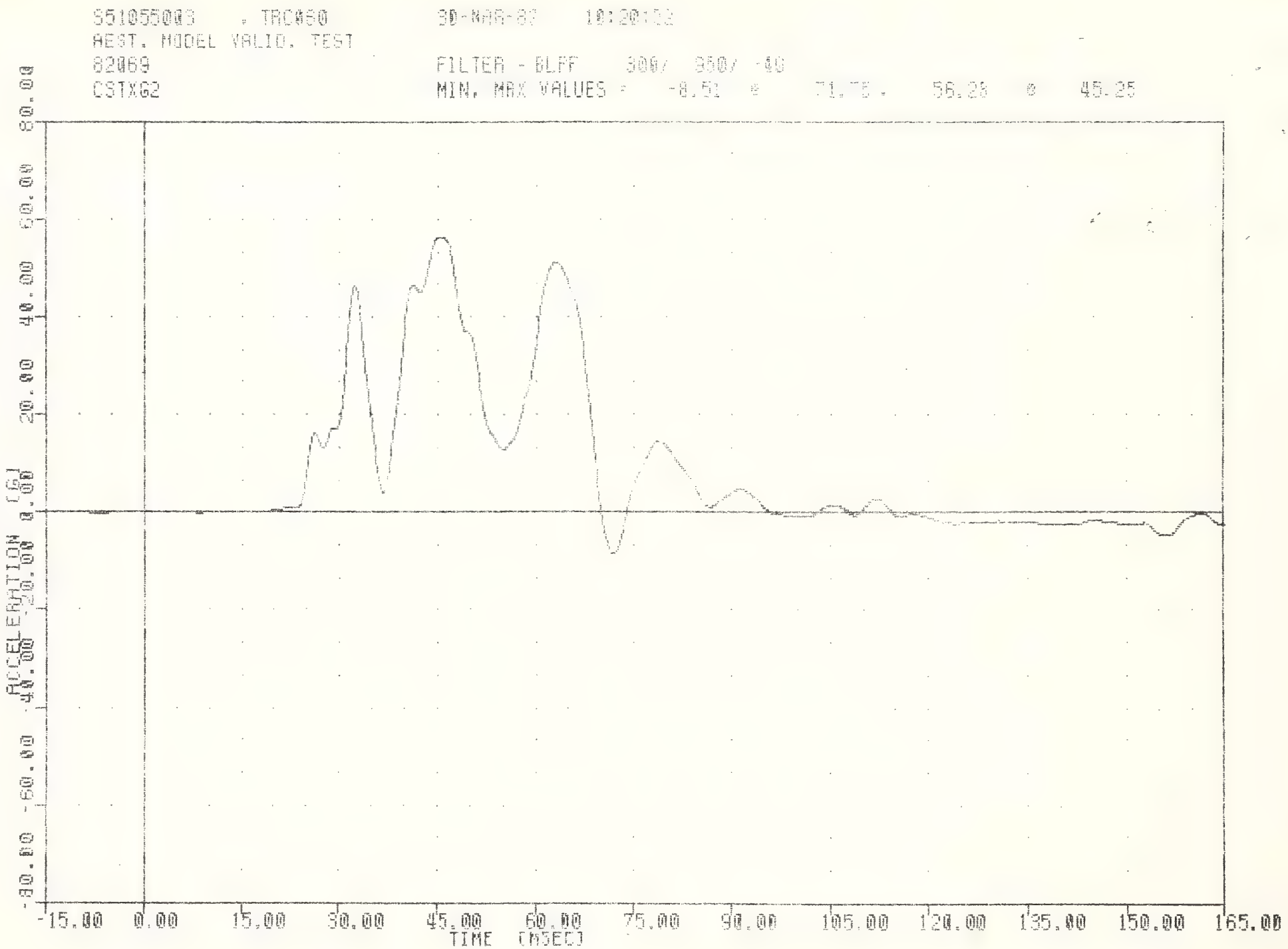
HEAD ACCELERATION OF AUTOMOBILE PASSENGER



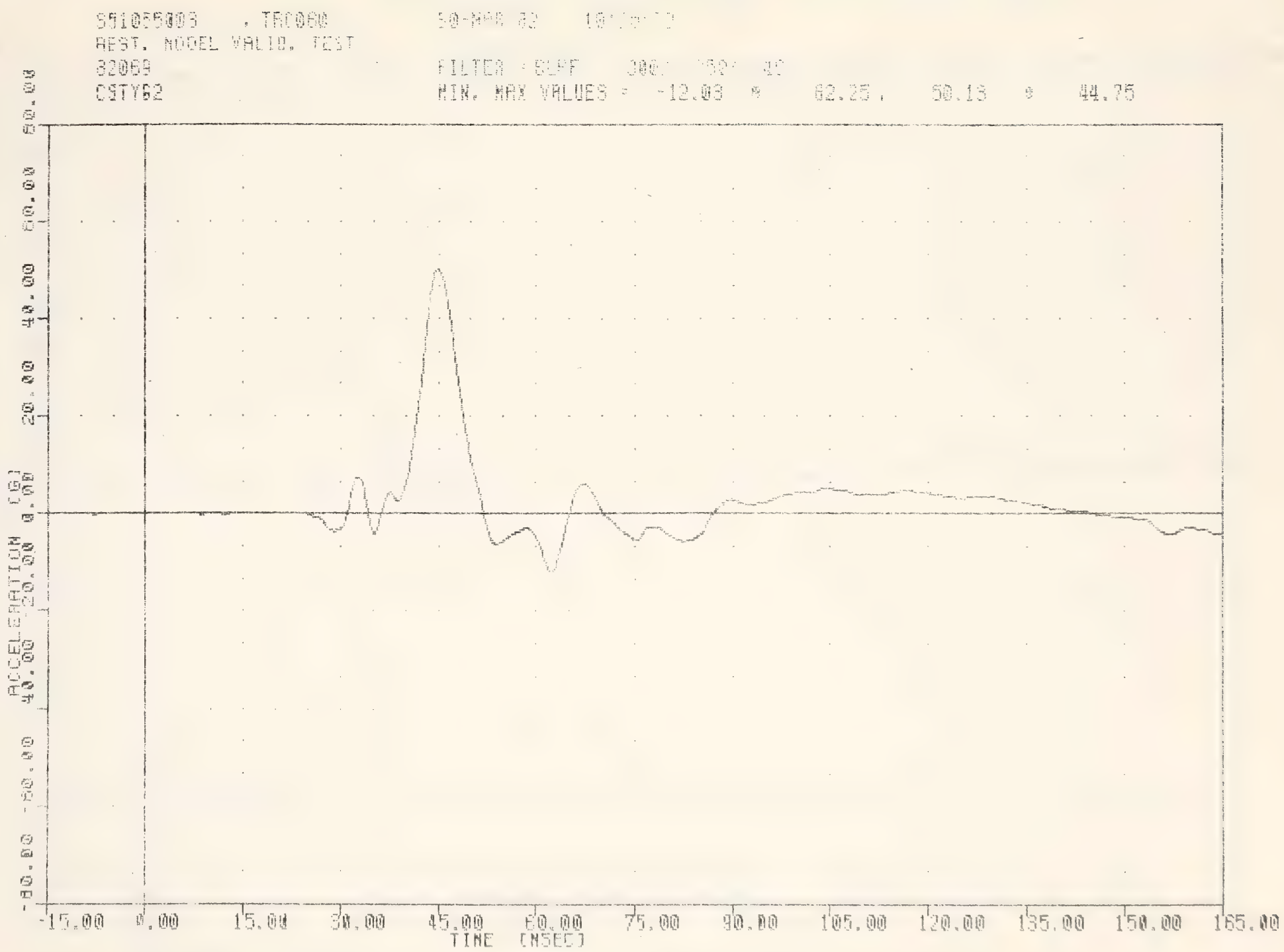
3 YR OLD HEAD RESULTANT (CLASS 100)



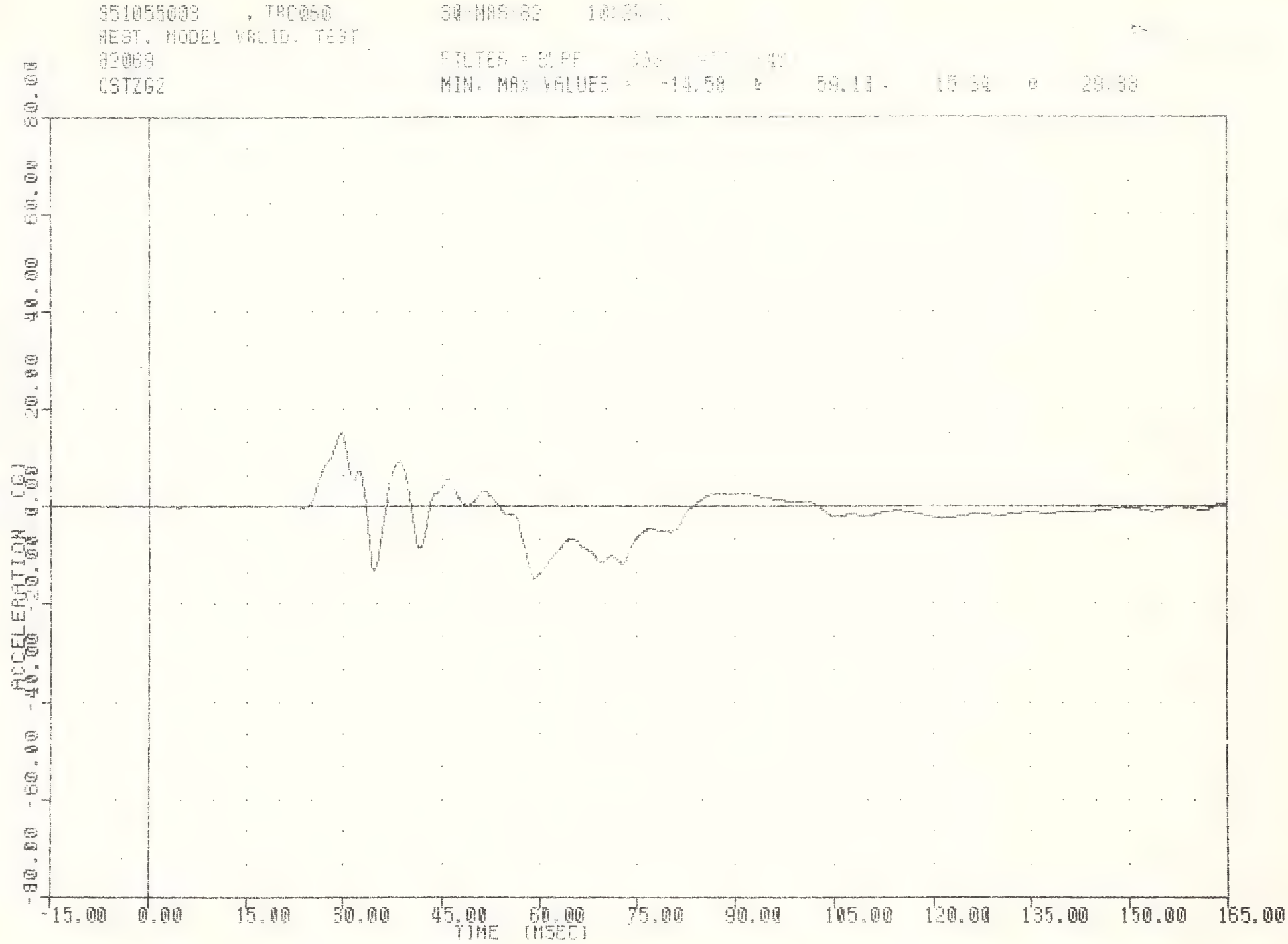
3 YR OLD HEAD IN SUD TANK (LEVEL 1001



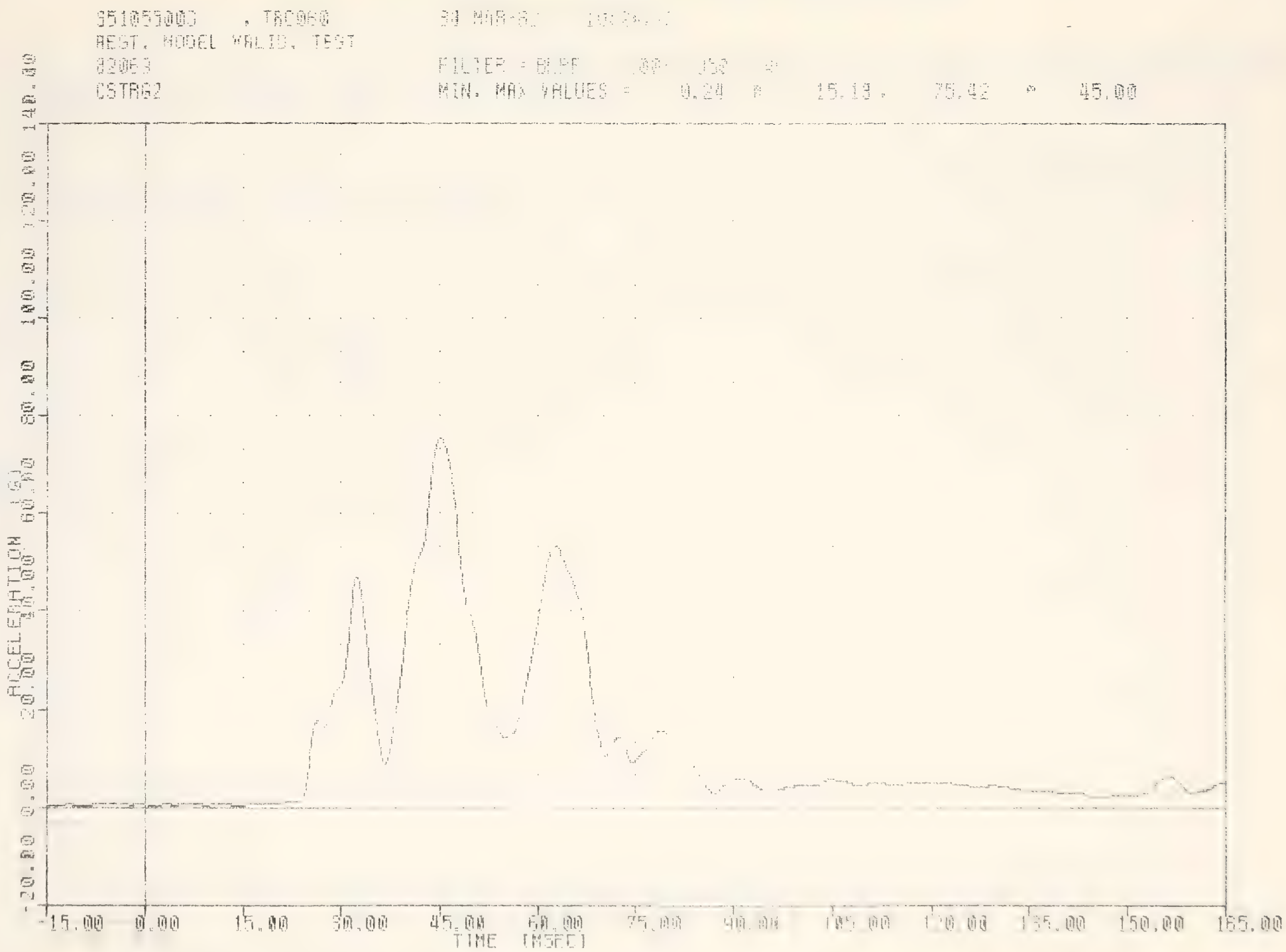
CHEST ACCELERATION X AXIS PASSENGER



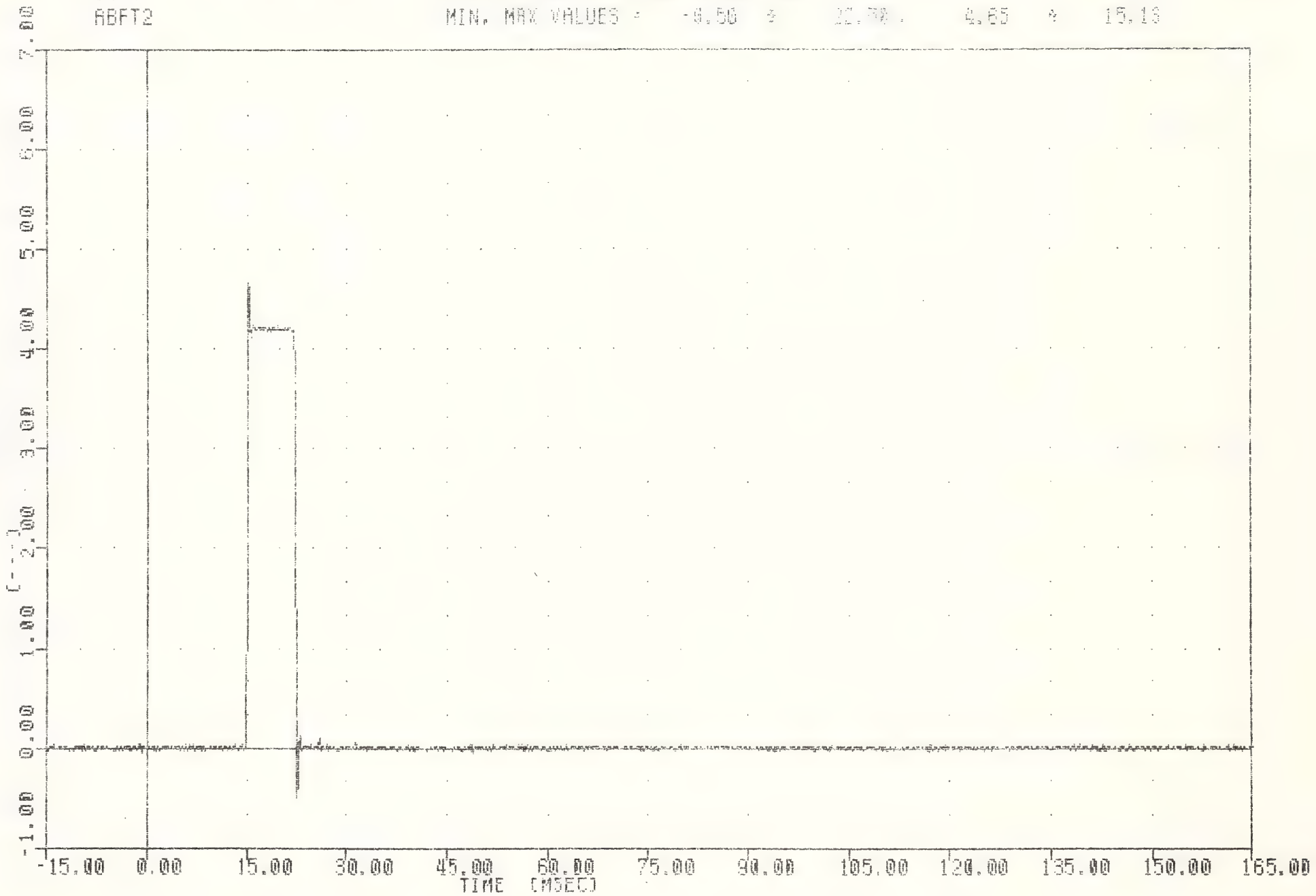
CHEST ACCELERATION Y MAN PASSENGER



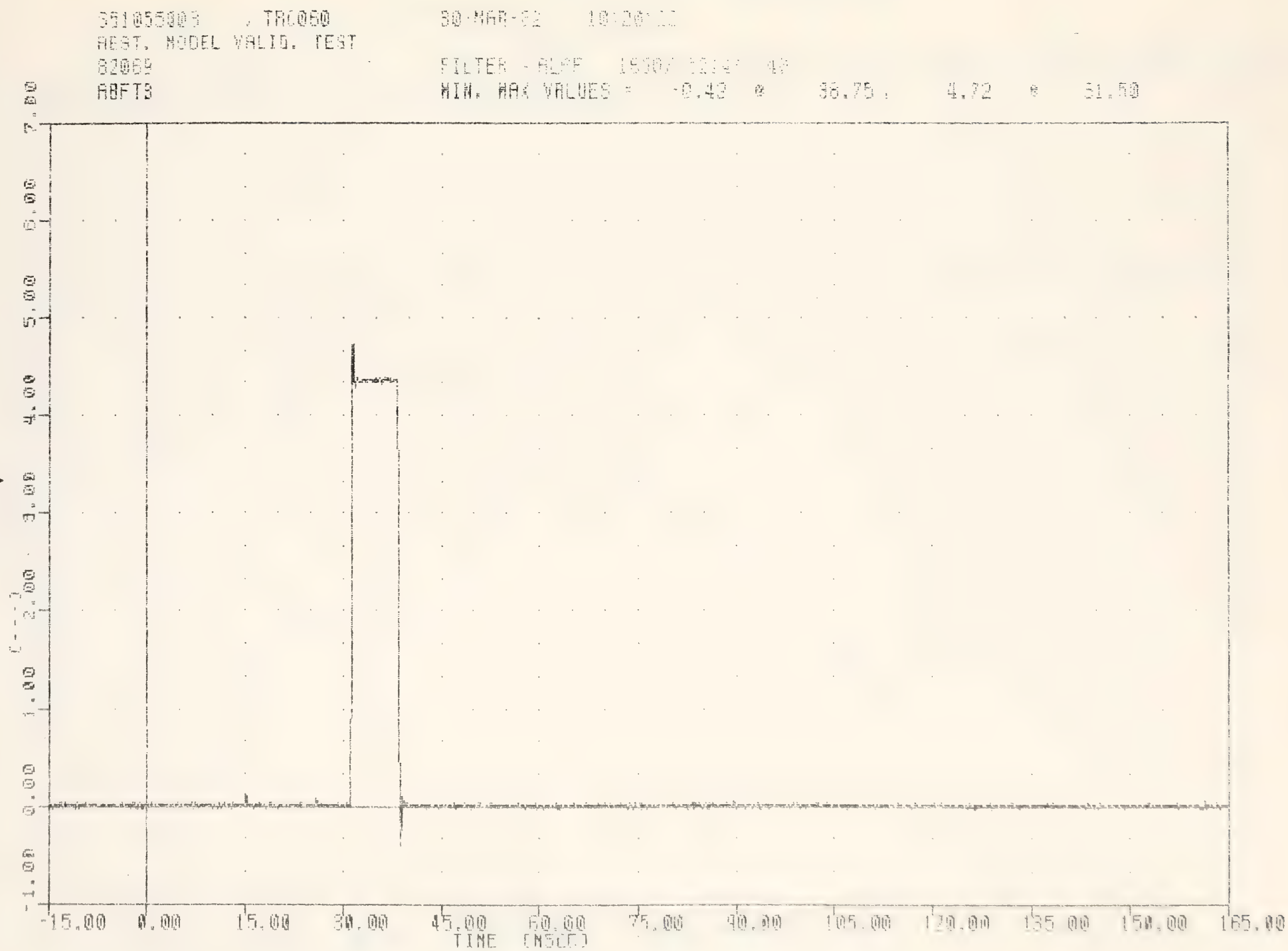
CHEST ACCELERATION Z AXIS PASSENGER



CHEST ACCELERATION OF DRIVING PASSENGER

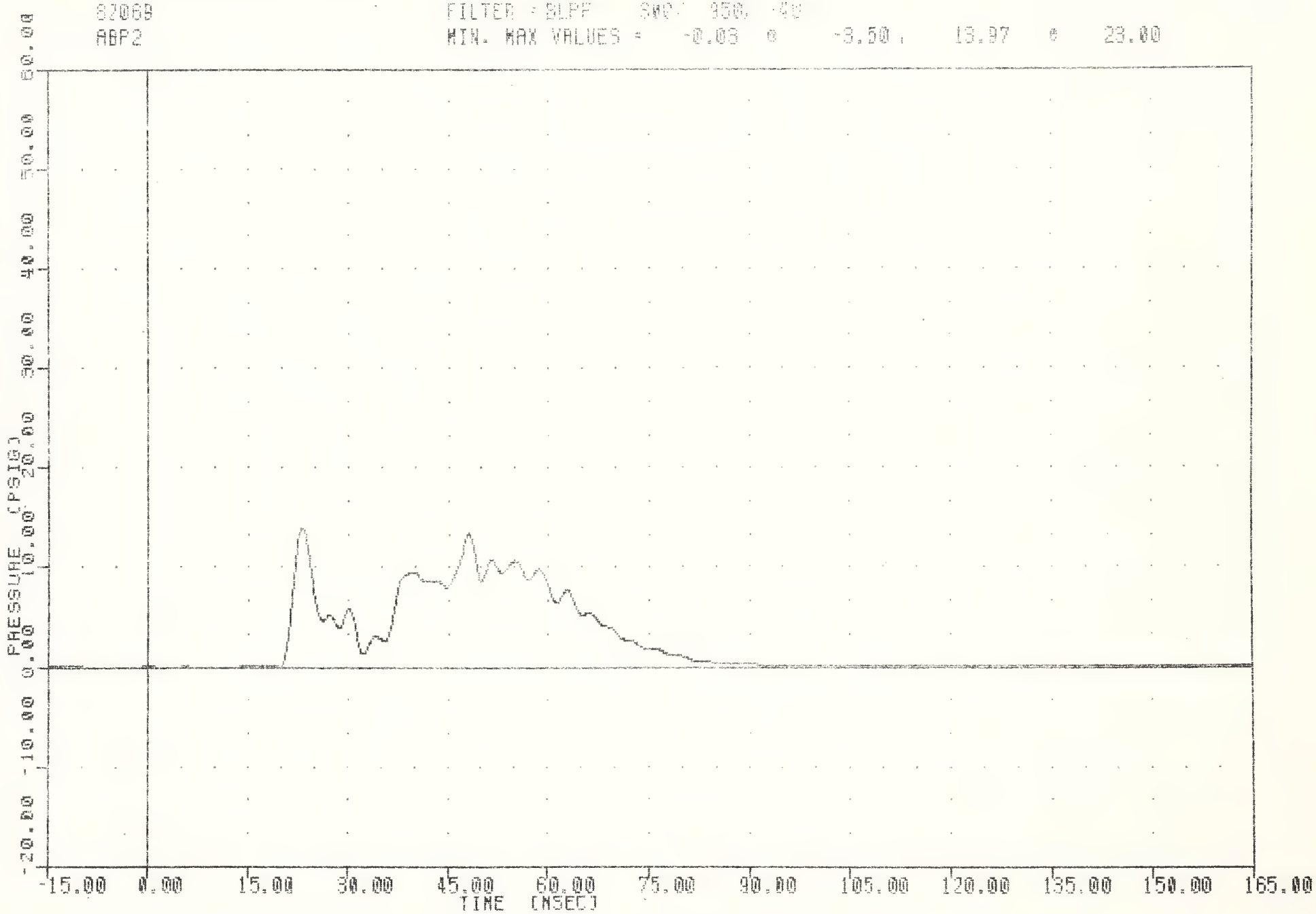


AIR BAG FIRING EVENT PASSENGER



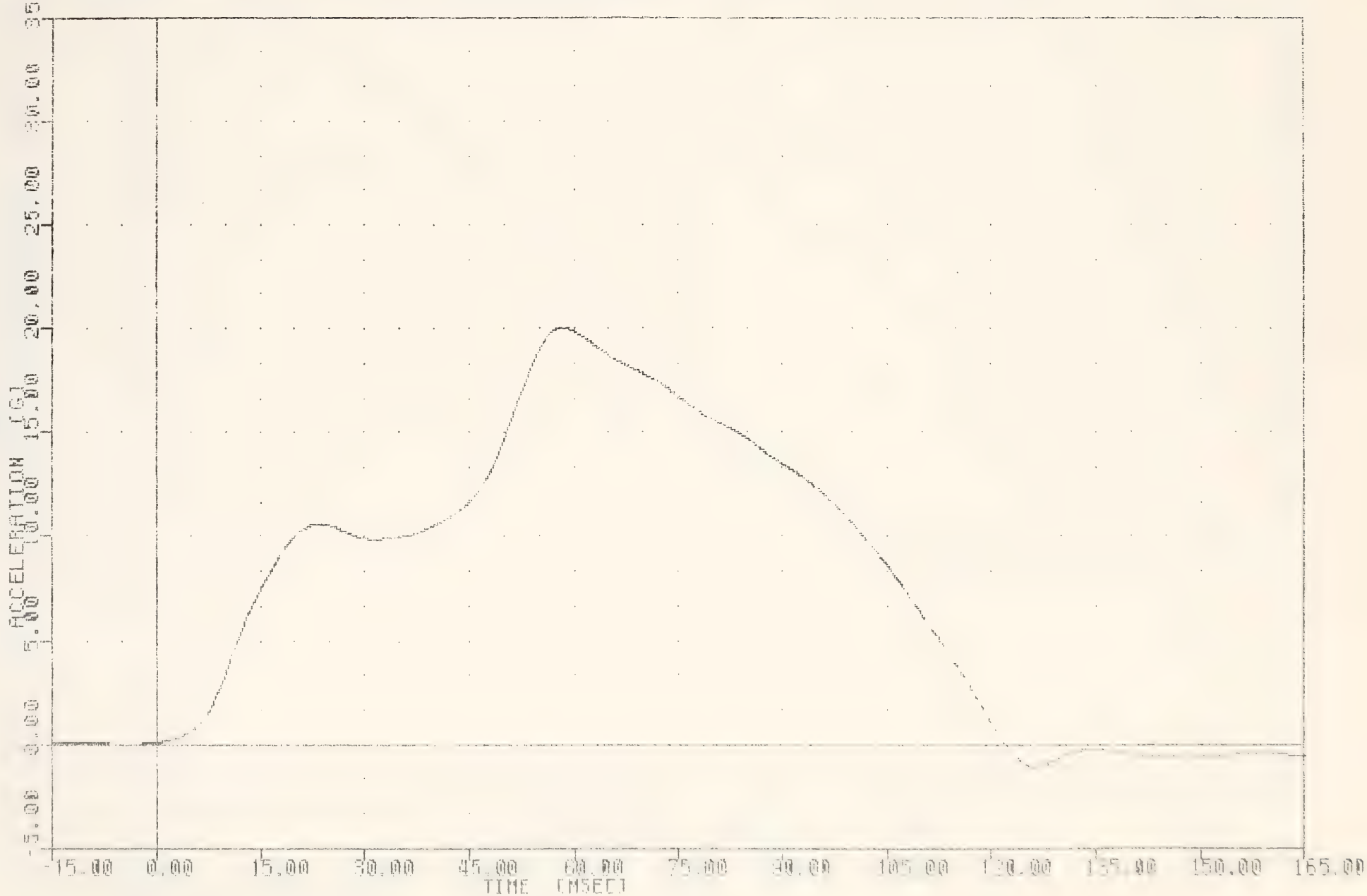
AIR BAG FIRING EVENT 4

S51055003 , TRC060 30-MAR-85 10:20:00
AEST. MODEL VALID. TEST
82068 FILTER = BLPF SMO: 950. -40
ABP2 MIN. MAX VALUES = -0.06 @ -3.50 , 13.97 @ 23.00



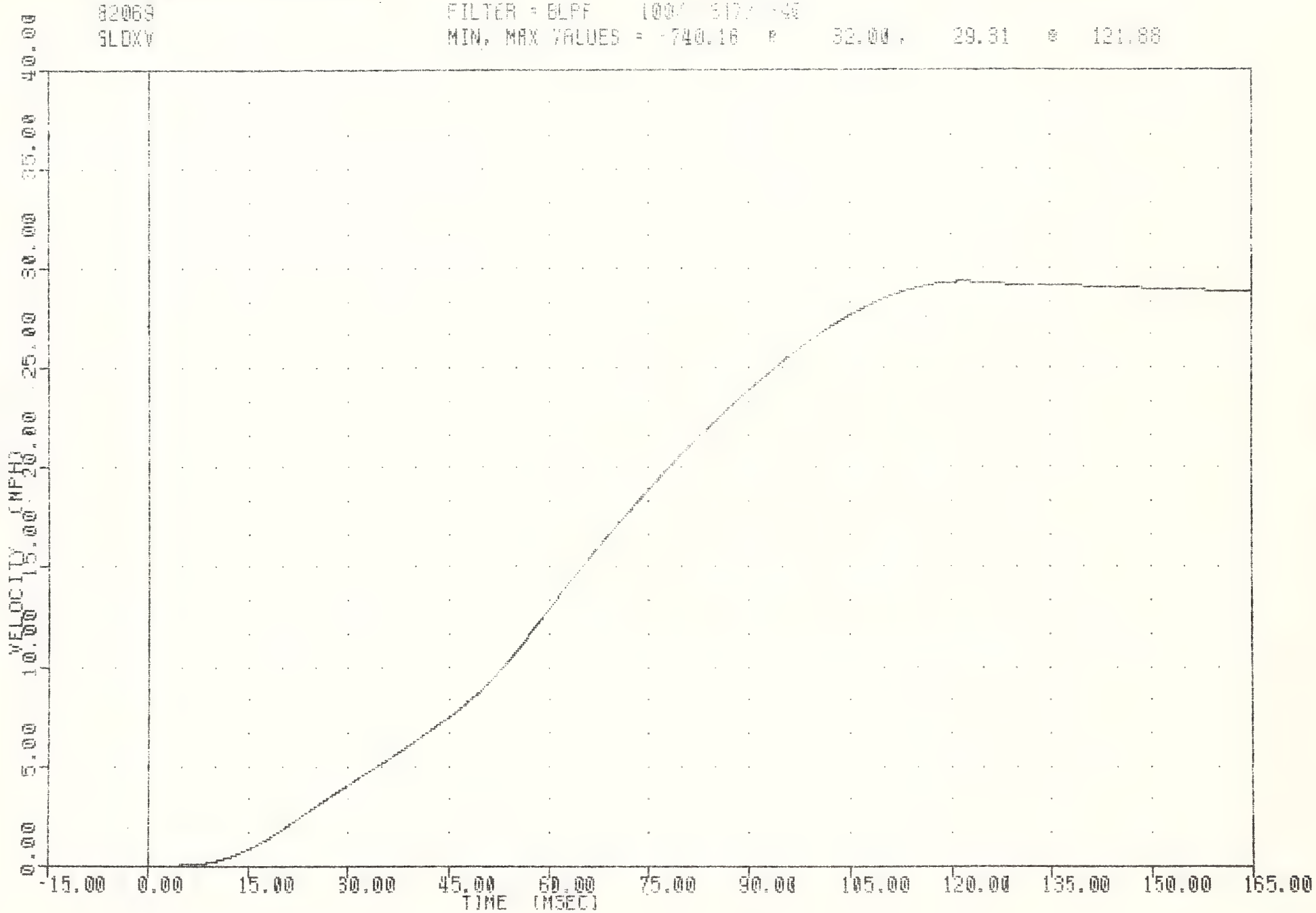
AIR BAG PRESSURE PASSENGER

S51055003 , TRCN60 30-MAR-83 16:20:12
REST. MODEL VALID. TEST
S2069 FILTER = BLPF 100% BITS
SLDXG MIN. MAX VALUES = -1.10 @ 126.00 , 20.05 @ 58.10

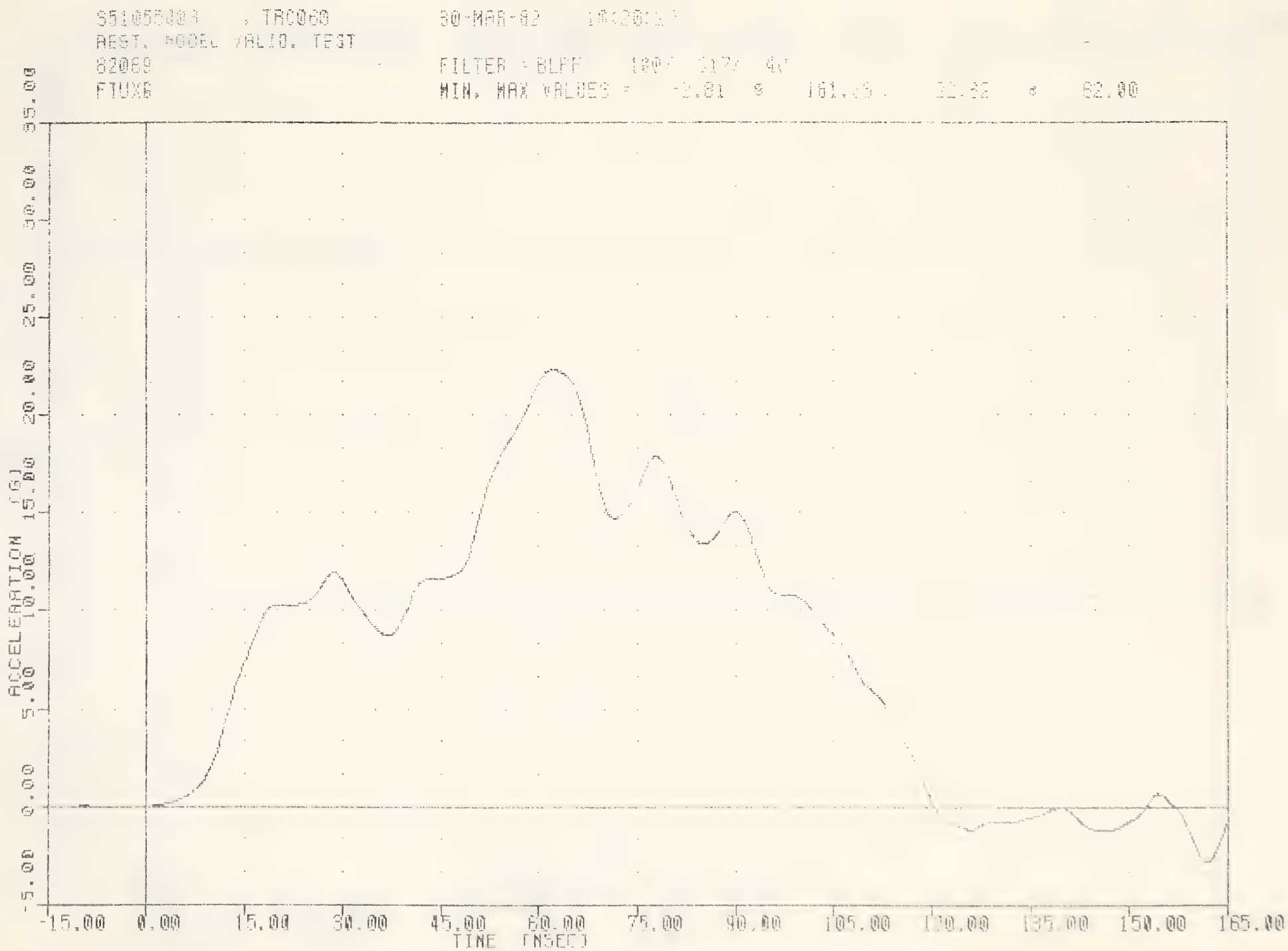


SLED ACCELERATION

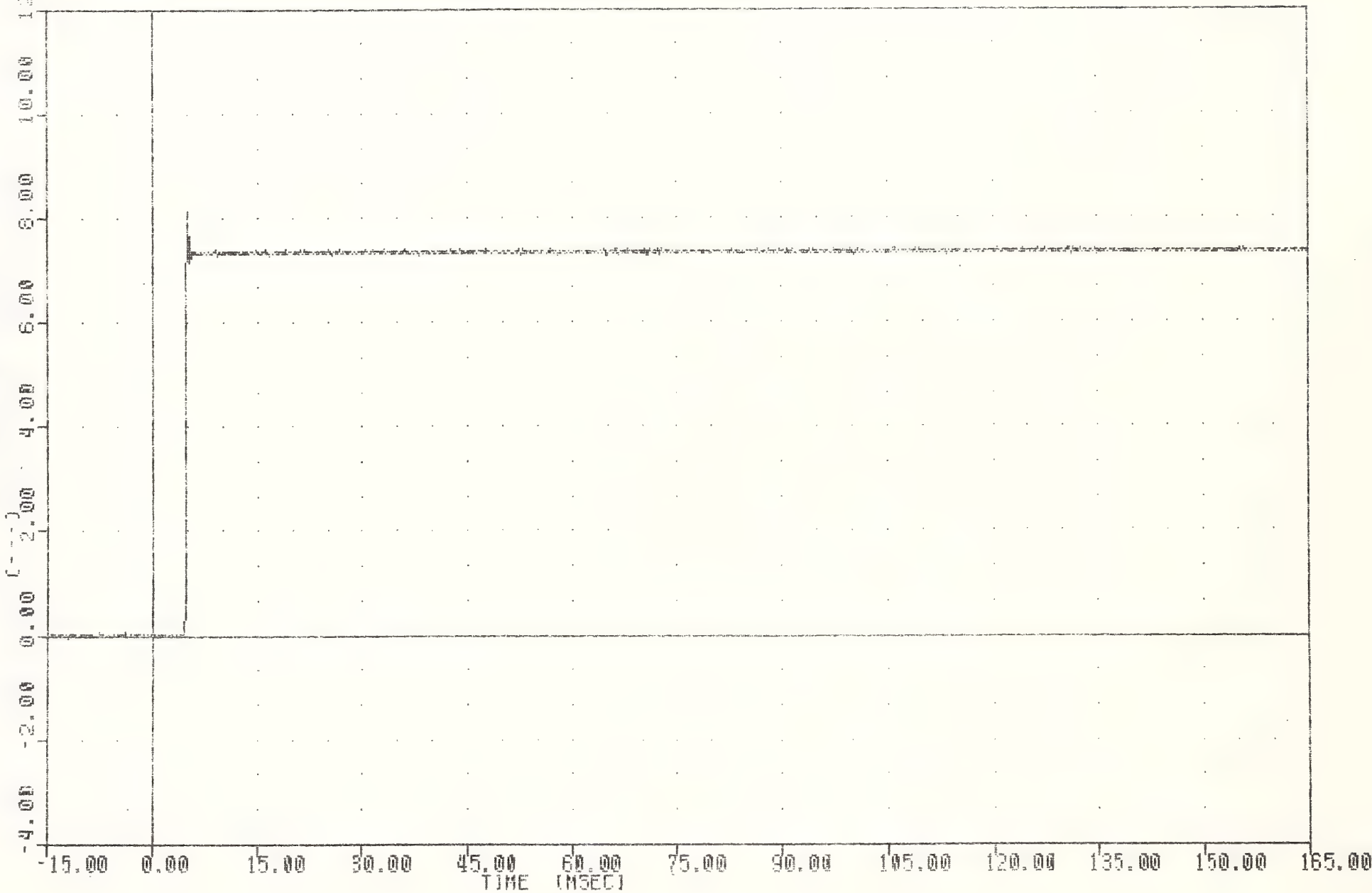
S510550003 , TRC060 30-MAR-82 10:20:22
REST. MODEL VALID. TEST
82069 FILTER = BLPF 100% 517 -46
SLDXV MIN, MAX VALUES = -740.16 @ 32.00 , 29.31 @ 121.88



SLED VELOCITY IN MPH


TRC060
30-MAR-82
REST. MODEL VALID. TEST
82089
FTUX6
FILTER = BLPF
MIN, MAX VALUES =
ACCELERATION (G)
-5.00
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
-15.00
0.00
15.00
30.00
45.00
60.00
75.00
90.00
105.00
120.00
135.00
150.00
165.00
TIME (MSEC)

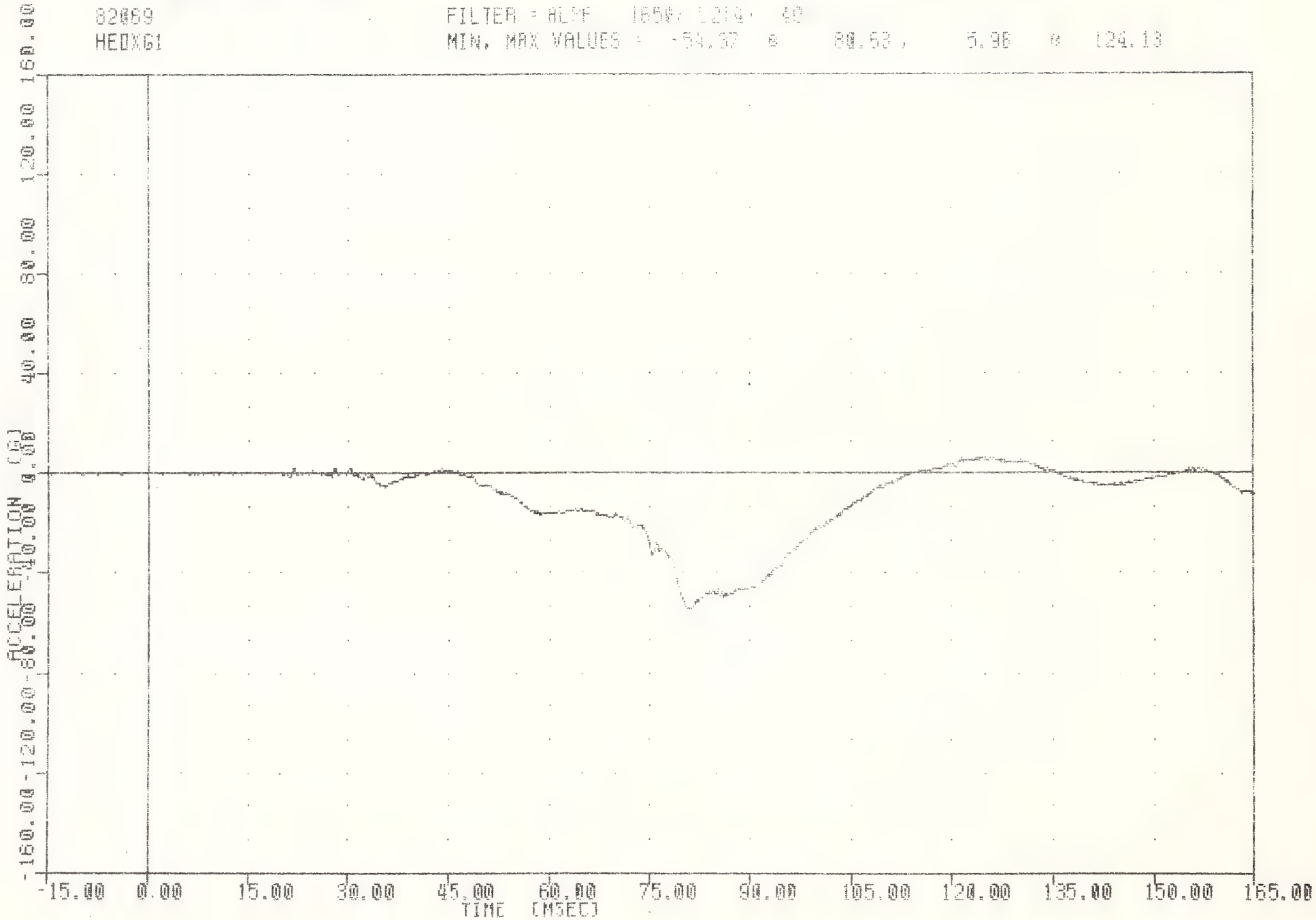
S51055003 , TRC060 30-MAR-82 10:28:32
REST, MODEL VALID, TEST
82069 FILTER = ALPF 1650/ 5214/ -40
SPSW MIN, MAX VALUES = -0.04 @ -12.25 , 8.12 @ 4.88



SLED POSITION SWITCH

TEST NO. 6

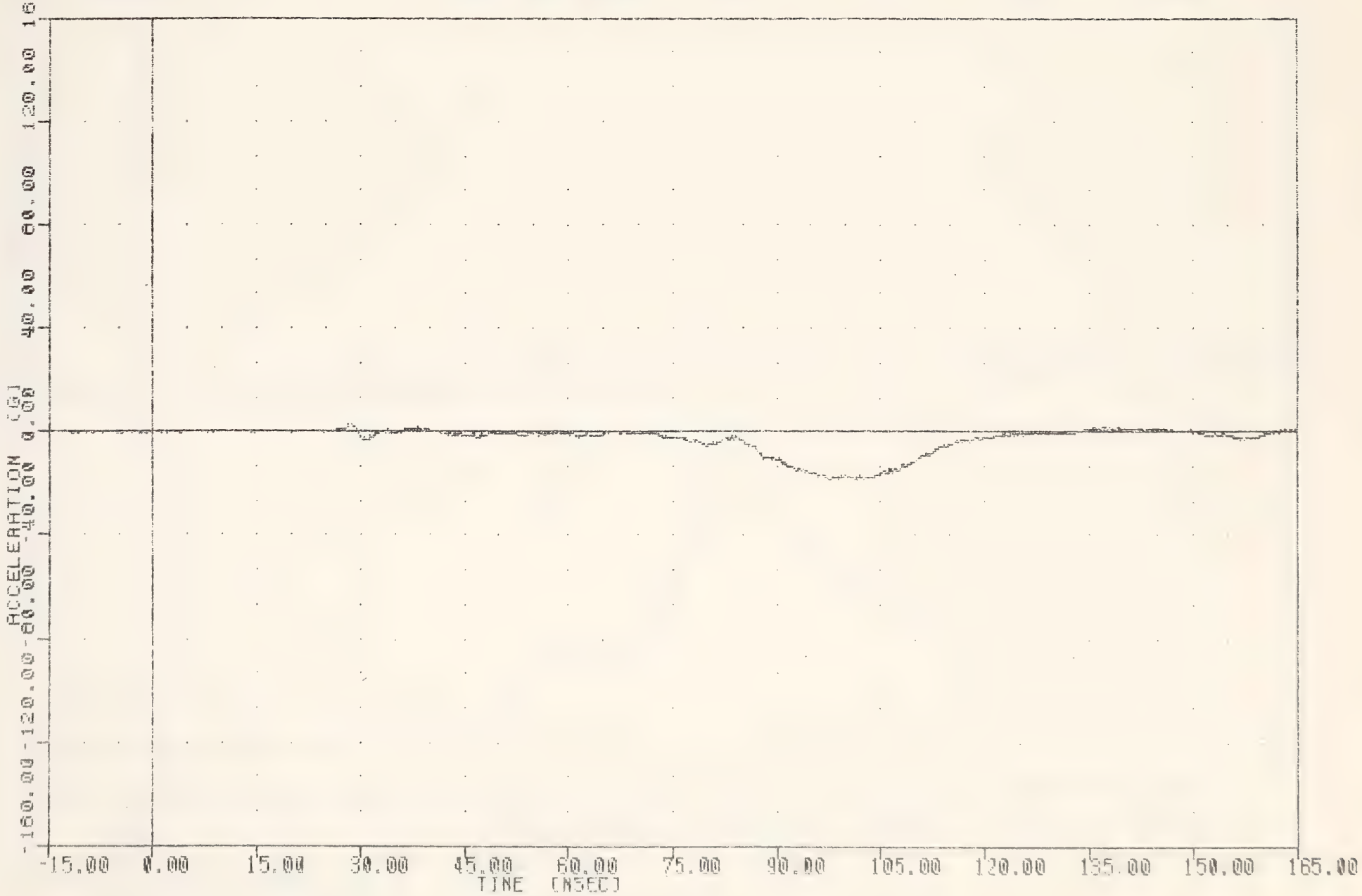
S5106S050 . TRCR61 SD-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = ALMF 1650, 1210, 60
HEDX61 MIN, MAX VALUES = -54.37 @ 80.53 , 5.96 @ 124.13



HEAD ACCELERATION X AXIS DRIVER

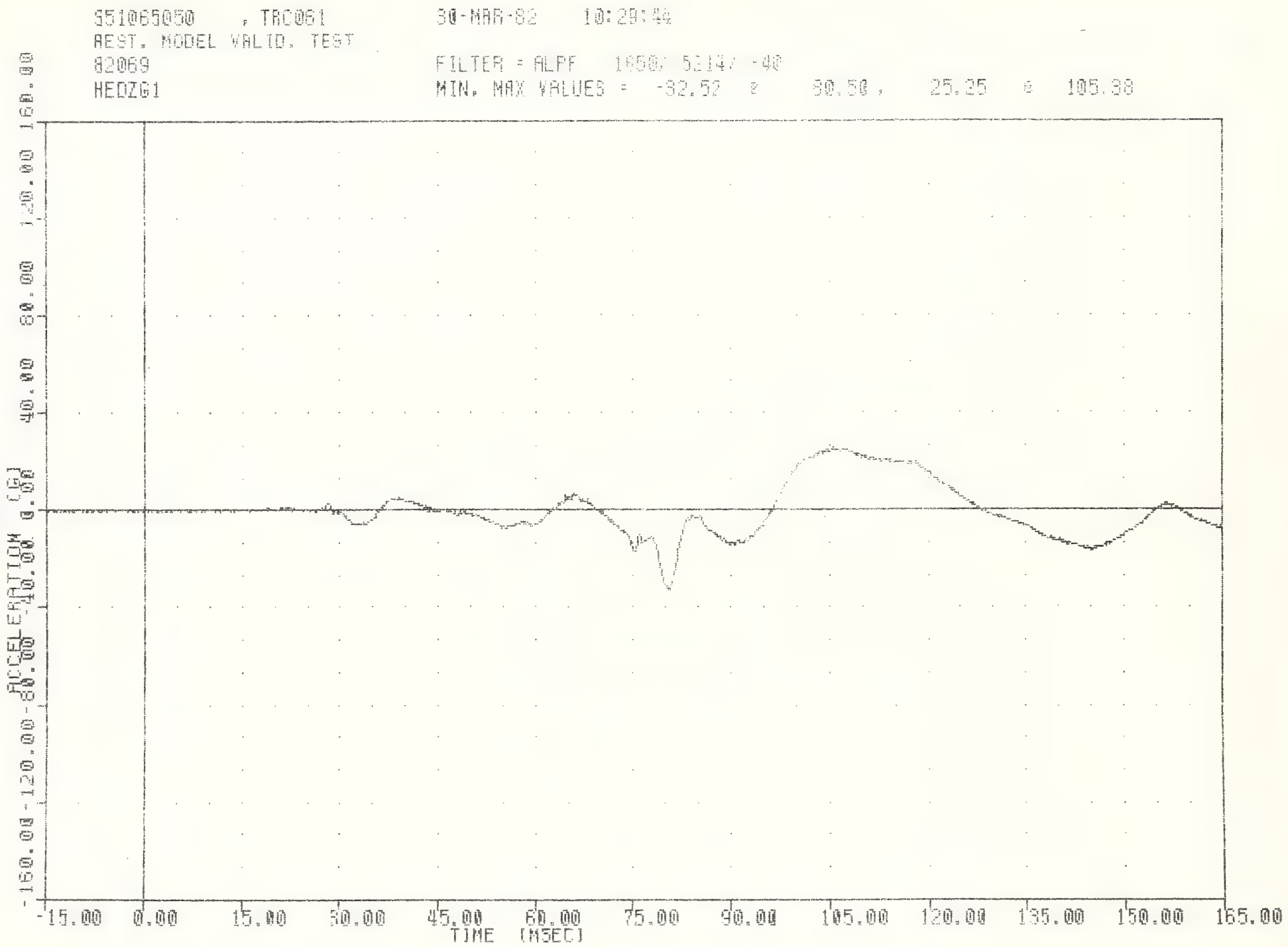
A-192

S51065050 , TRC061 30-MAR-82 10:29:48
REST. MODEL VALID. TEST
82069 FILTER = ALPF 1650/ 5214/ -40
HEDYB1 MIN. MAX VALUES = -18.46 @ 97.38 , 3.30 @ 28.38



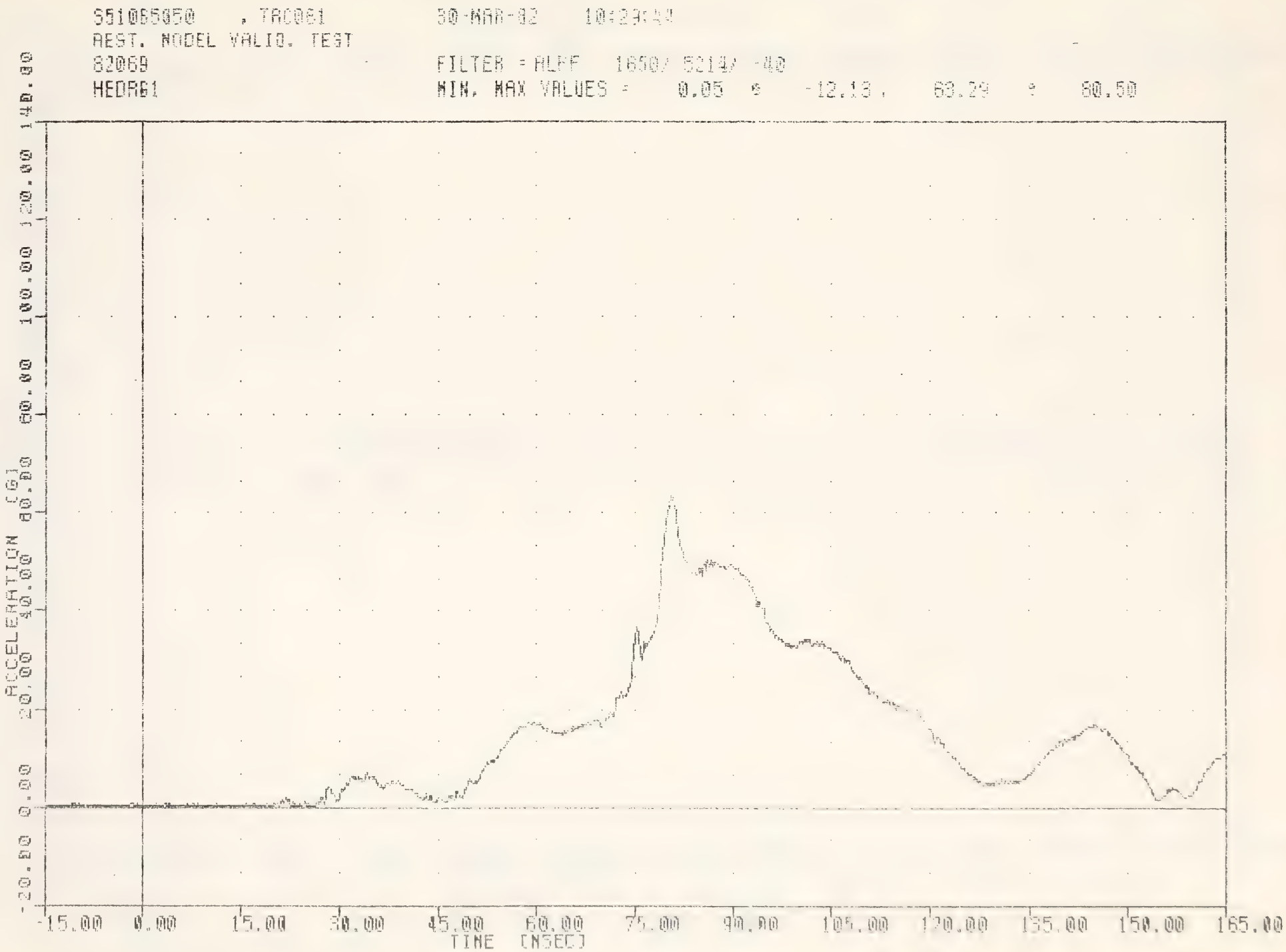
HEAD ACCELERATION Y AXIS DRIVER

A-153



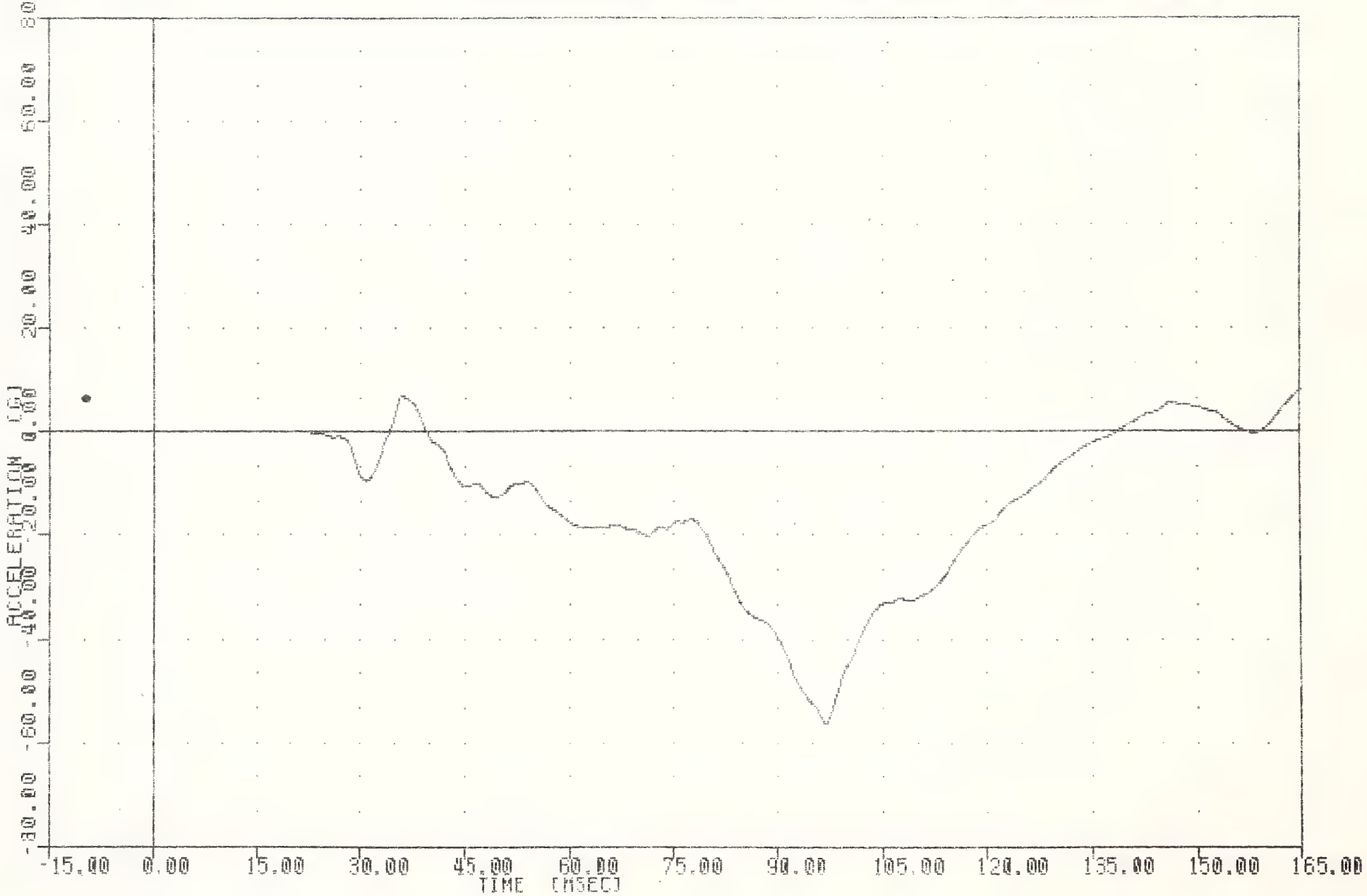
HEAD ACCELERATION Z AXIS DRIVER

A-154



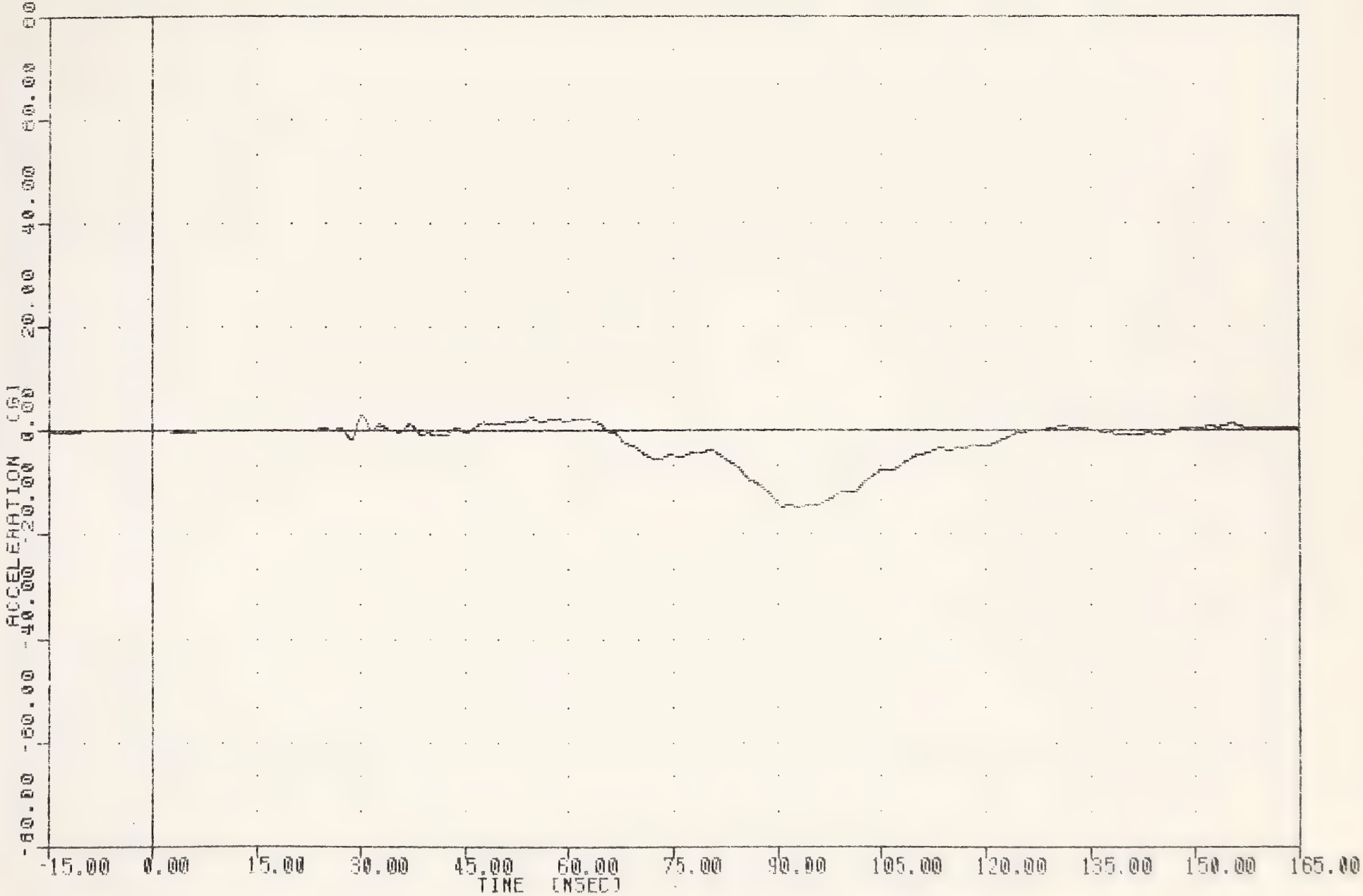
HEAD ACCELERATION RESULTANT DRIVER

S51065050 , TRC061 30-MAR-82 10:29:04
REST. MODEL VALID. TEST
82069 FILTER = BLPF 300/ 950/ -40
CSTXG1 MIN. MAX VALUES - -56.38 @ 96.75 , 8.28 @ 165.00

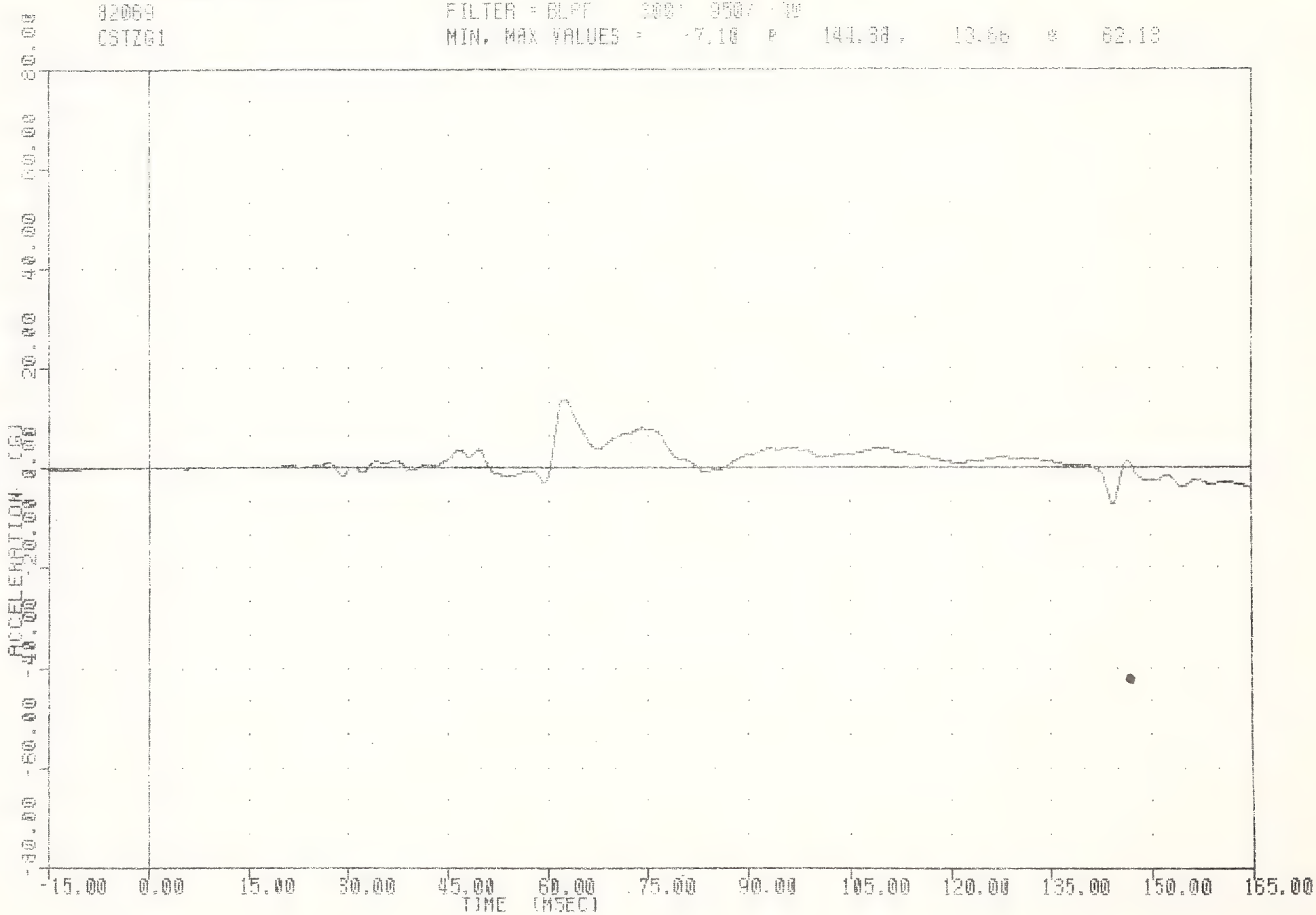


CHEST ACCELERATION X AXIS DRIVER

S51065050 , TRC061 30-MAR-82 10:39:44
REST. MODEL VALID. TEST
82068 FILTER = BLPF 300/ 950/ -40
CSTY61 MIN. MAX VALUES = -14.80 @ 93.00 , 2.96 @ 30.13

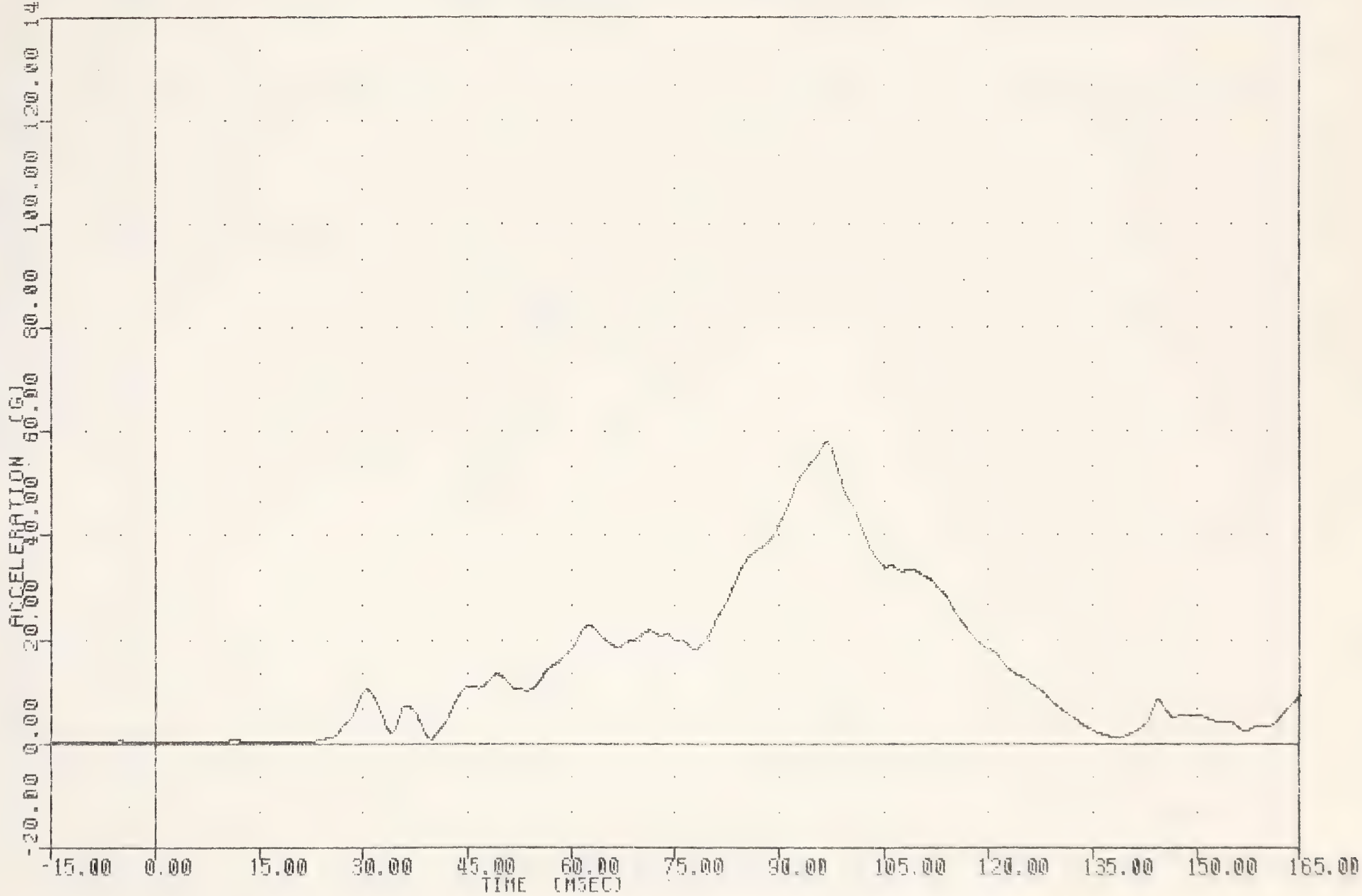


CHEST ACCELERATION Y AXIS DRIVER



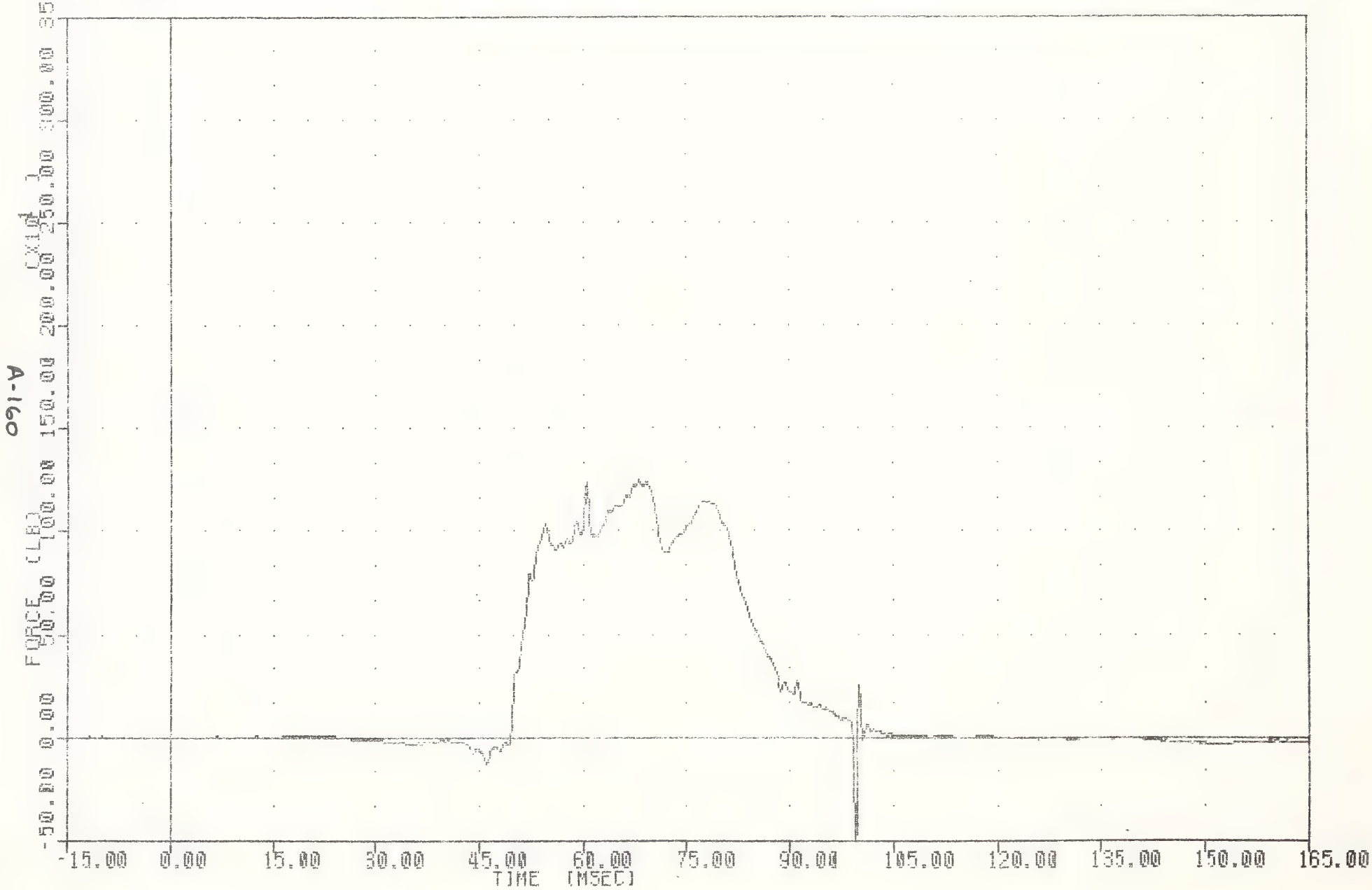
CHEST ACCELERATION Z AXIS DRIVER

S51085050 . TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = BLPF 300/ 950/ -40
CSTR61 MIN, MAX VALUES = 0.22 @ 9.00 , 58.11 @ 96.75



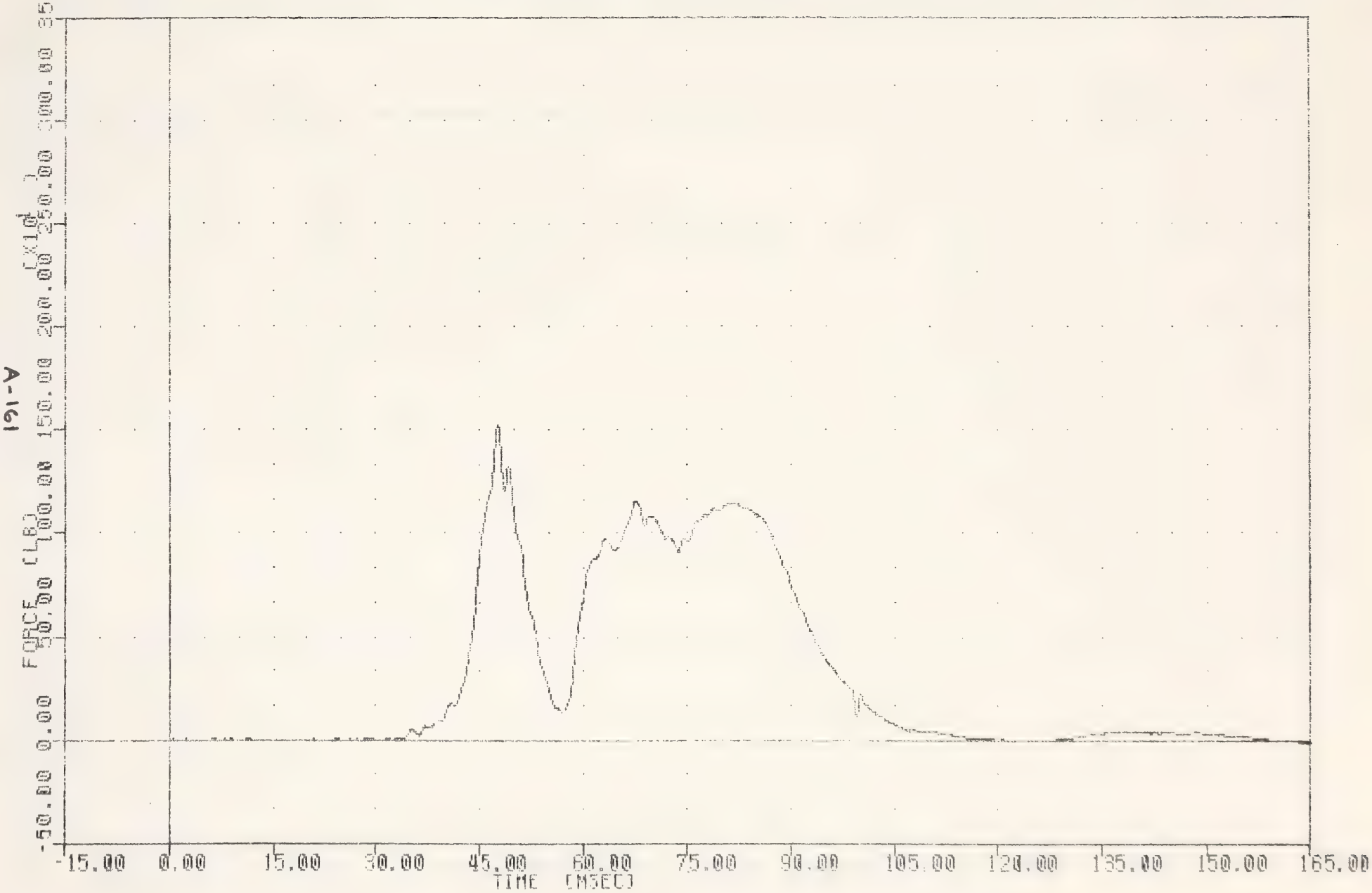
CHEST ACCELERATION RESULTANT DRIVER

351065050 , TRC061 30-MAR-82 12:26:32
REST. MODEL VALID. TEST
82069 FILTER - BLPF 1000/ 3170/ -90
LFMF1 MIN. MAX VALUES = -535.14 @ 99.38 , 1246.27 @ 68.00

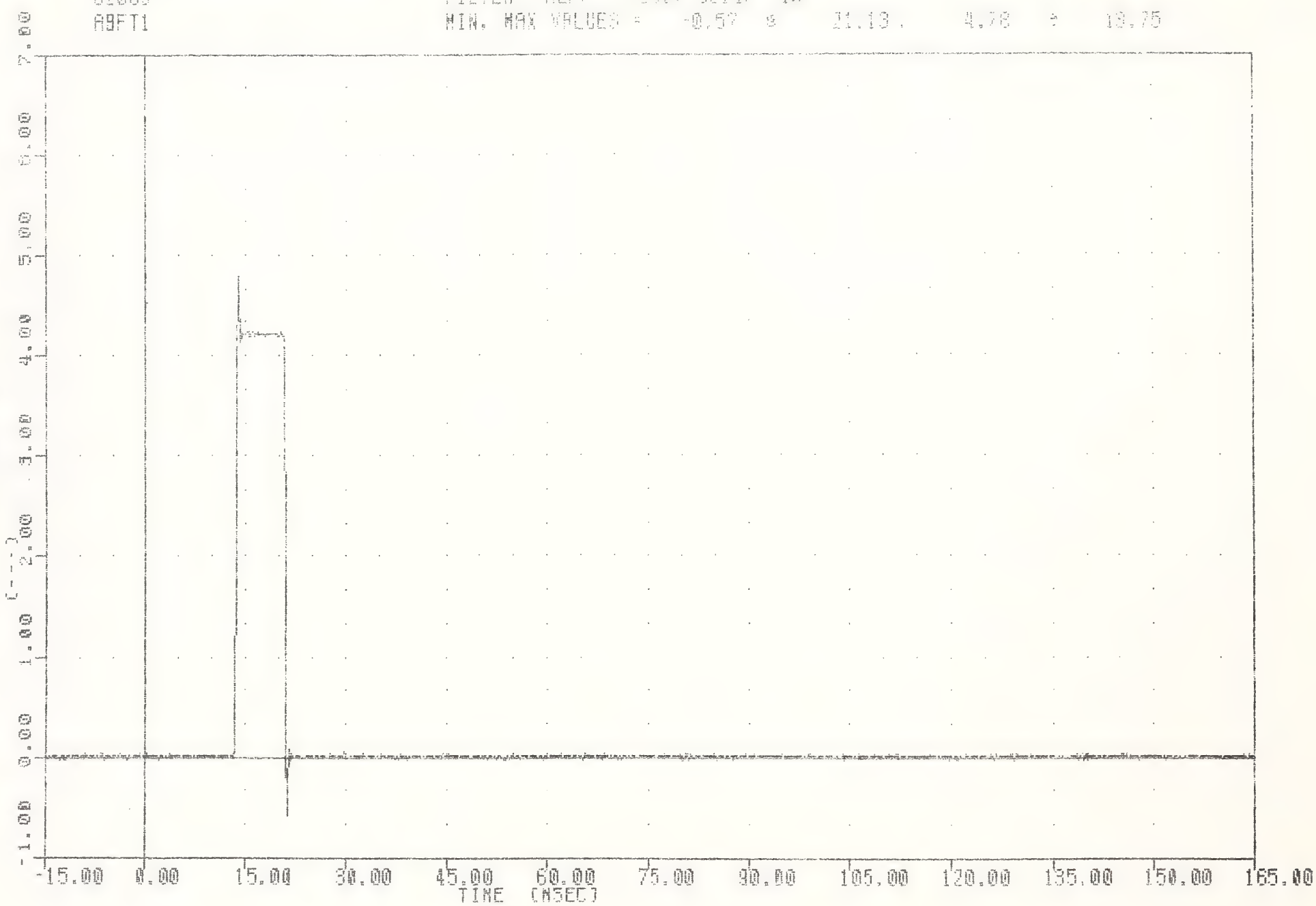


LEFT FEMUR FORCE DRIVER

S51065050 . TRCN61 SB-MAR-82 12:28:32
REST. MODEL VALID. TEST
82069 FILTER = BLPF 1000/ 5170/ -40
RFNF1 MIN. MAX VALUES = -11.97 @ 164.75 - 1528.44 @ 47.63

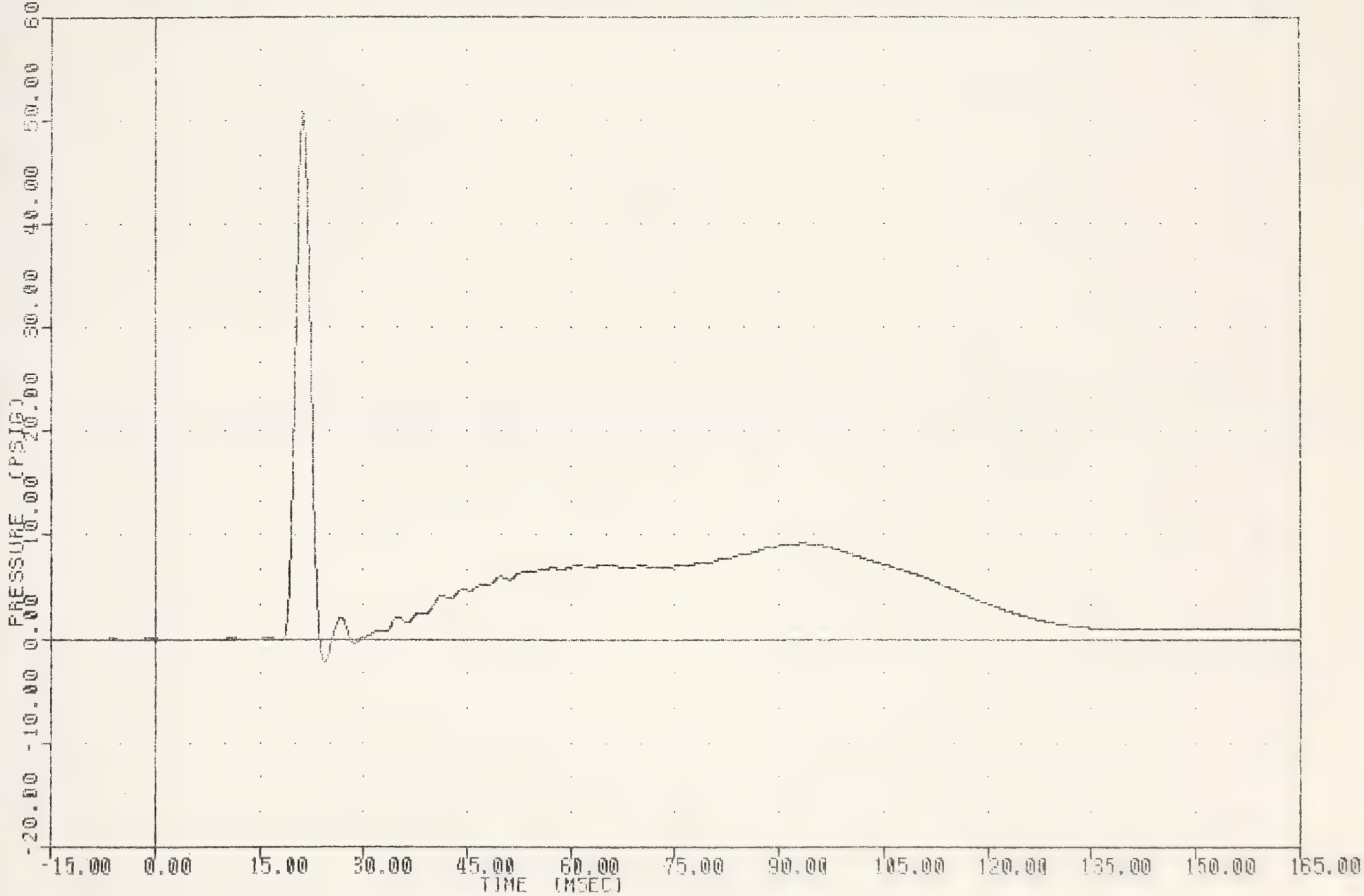


RIGHT FEMUR FORCE DRIVER



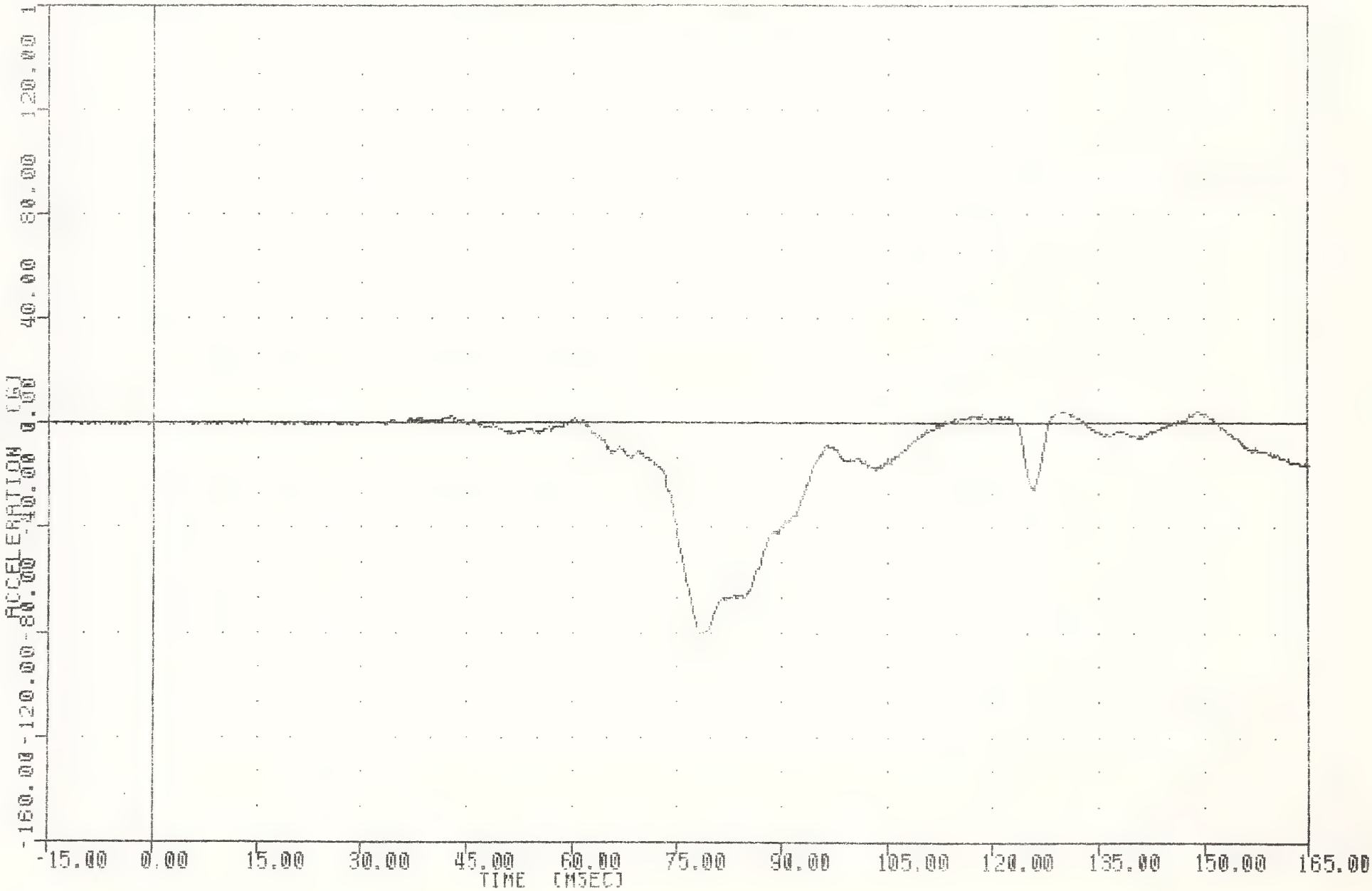
AIR BAG FIRING EVENT DRIVER

S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = BLPF 300/ 850/ -40
ABP1 MIN. MAX VALUES = -2.26 @ 24.25 , 50.75 @ 21.13



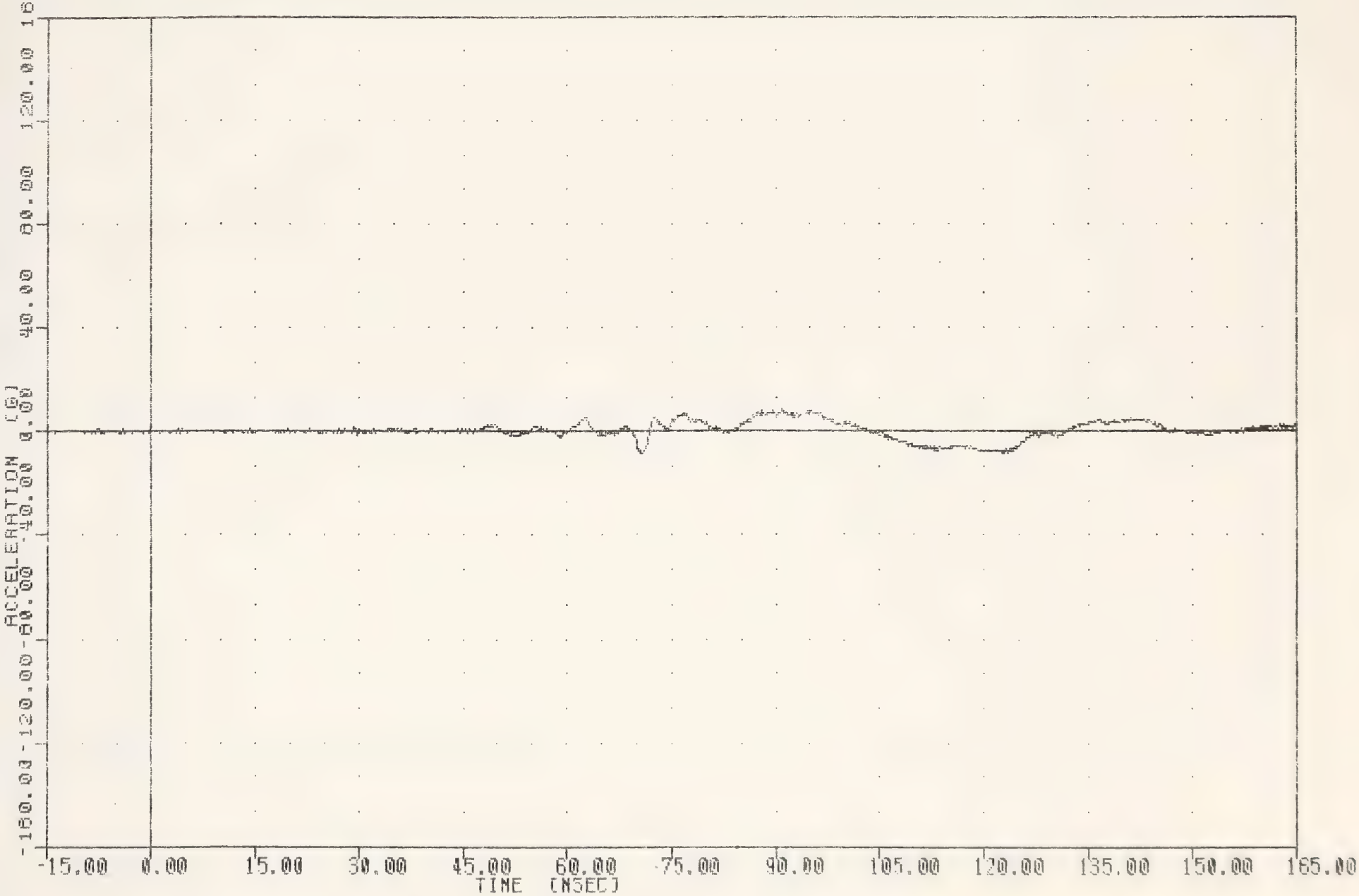
AIR BAG PRESSURE DRIVER

S51065050 . TAC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST.
82069 FILTER = ALPF 1650/ 5214/ -40
HEOXG2 MIN, MAX VALUES = -80.59 @ 78.25 . 4.69 @ 129.75

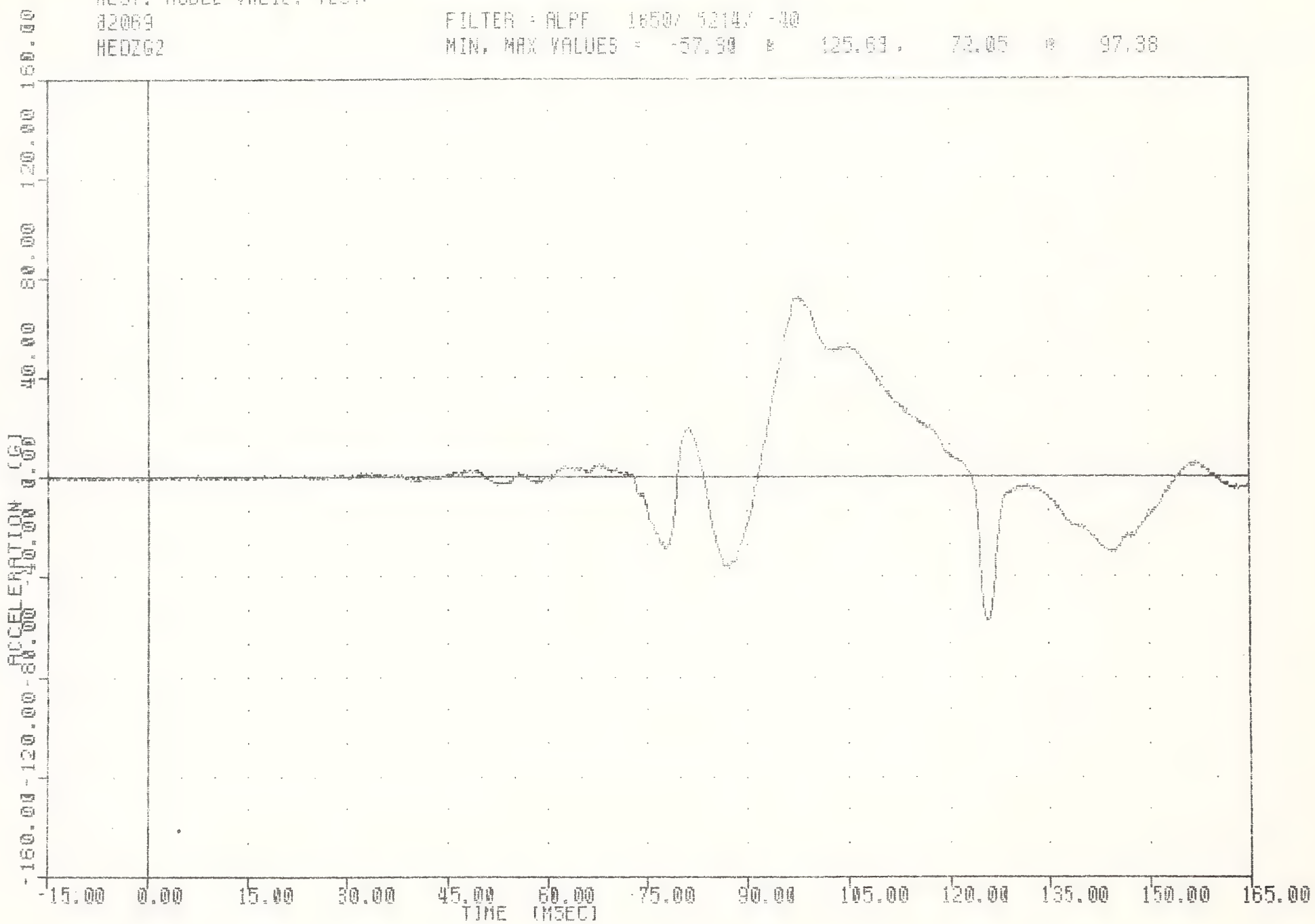


HEAD ACCELERATION X AXIS PASSENGER

S510B5050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = ALPF 1650/ 5214/ -40
HEDY62 MIN, MAX VALUES = -8.53 @ 70.63 , 8.49 @ 90.88

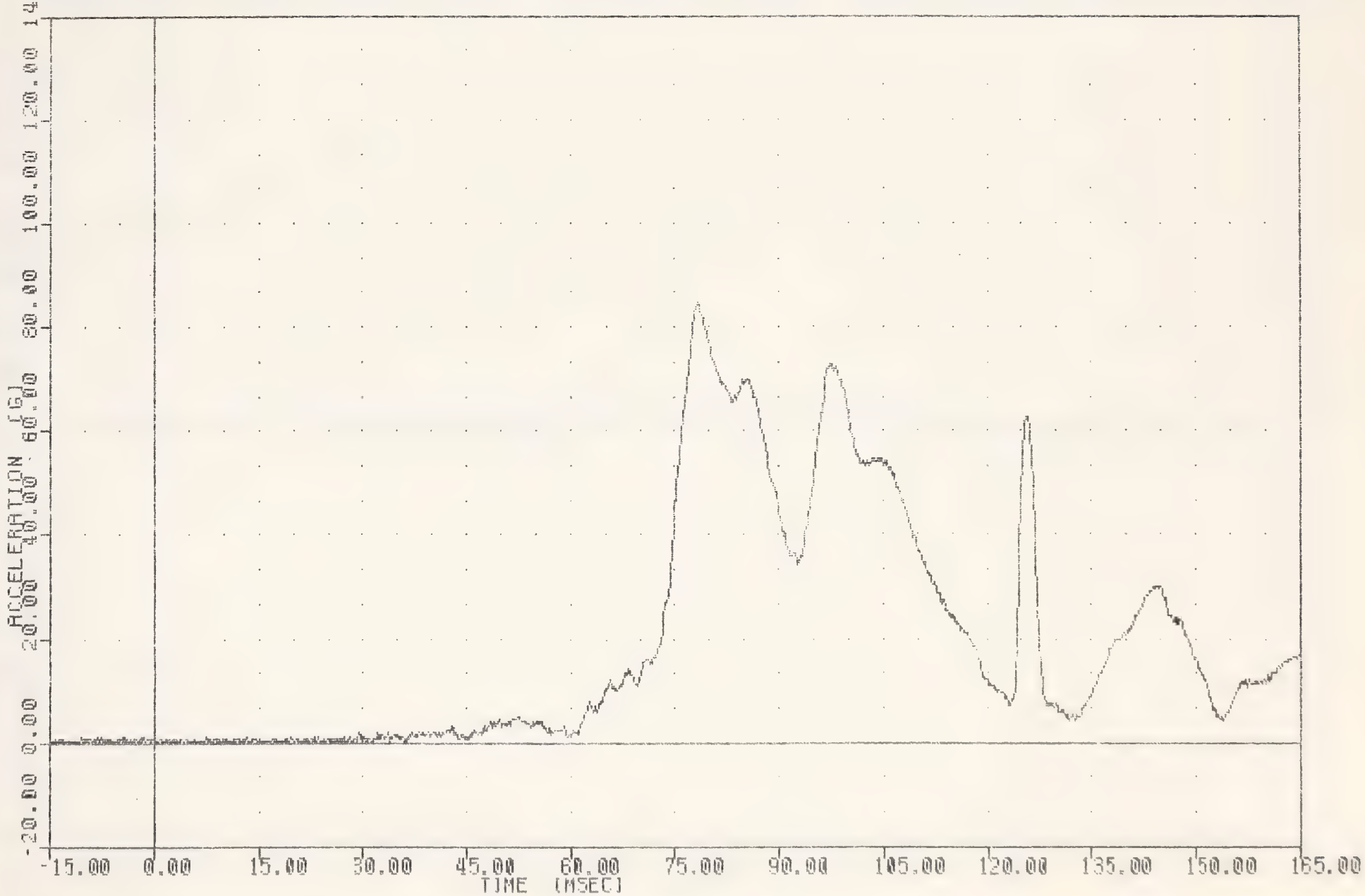


HEAD ACCELERATION Y AXIS PASSENGER

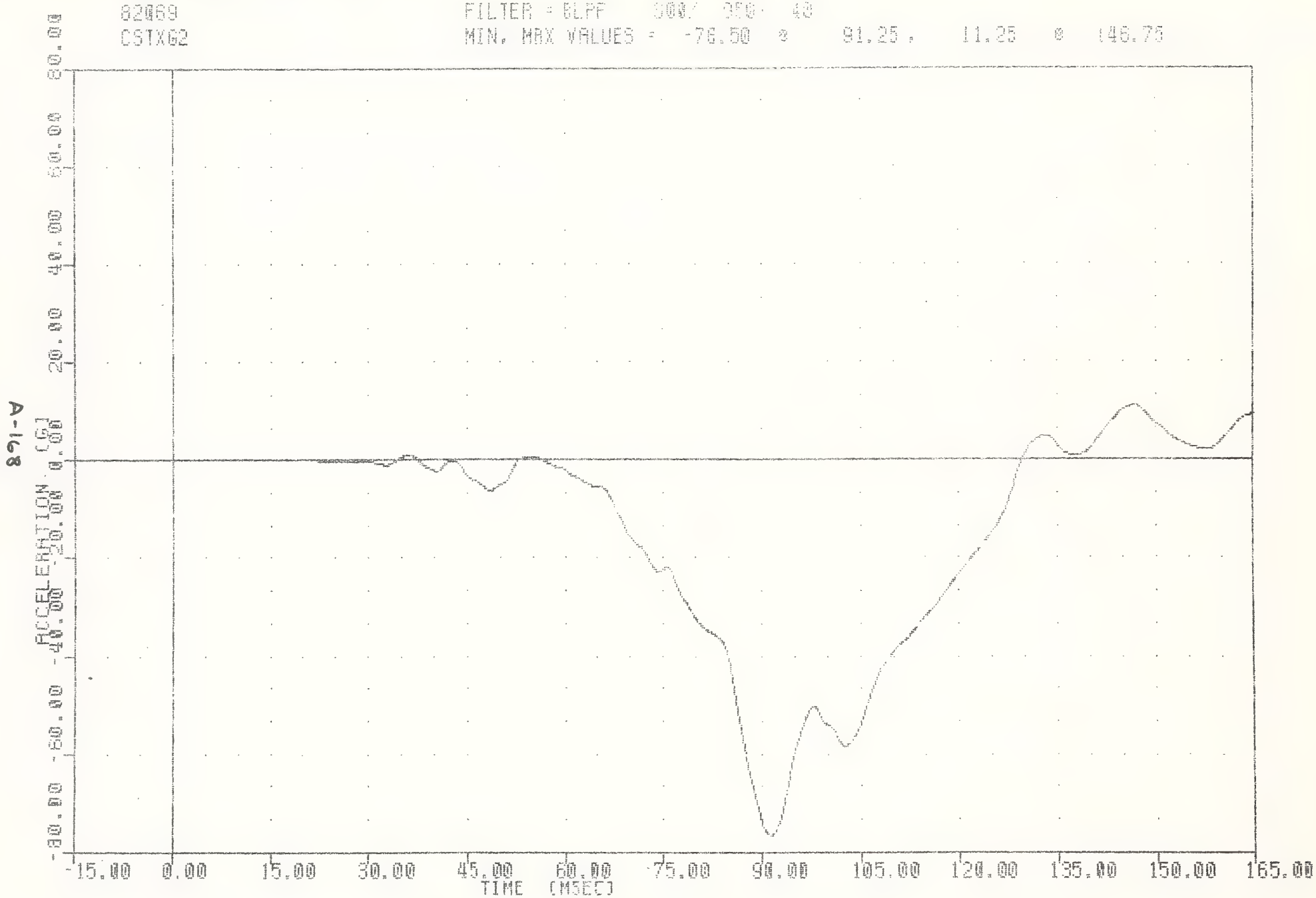


HEAD ACCELERATION Z AXIS PASSENGER

S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = ALPF 1650/ 5214/ -40
HEDRG2 MIN. MAX VALUES = 0.05 @ 16.25 , 64.54 @ 78.25

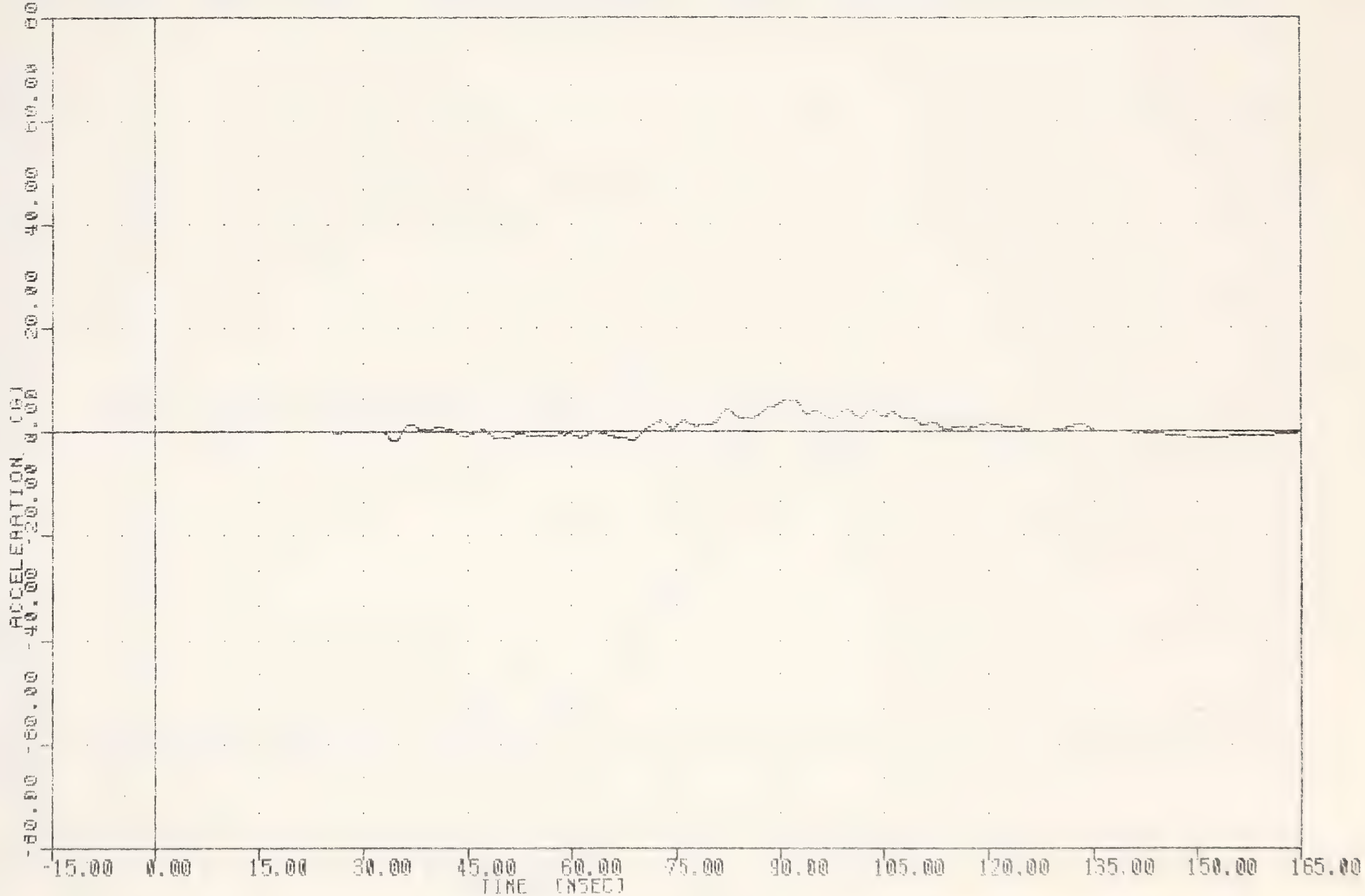


HEAD ACCELERATION RESULTANT PASSENGER

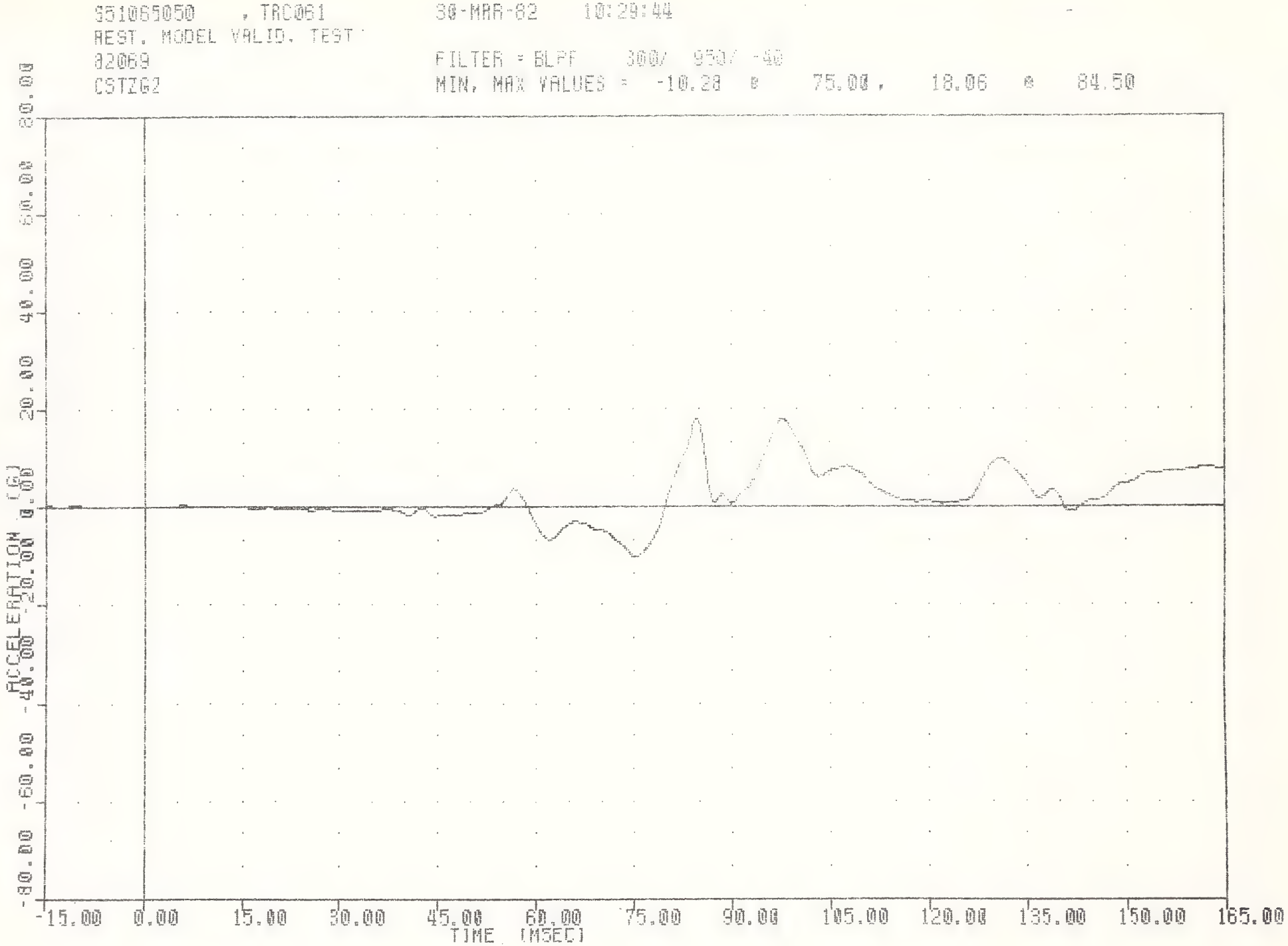


CHEST ACCELERATION X AXIS PASSENGER

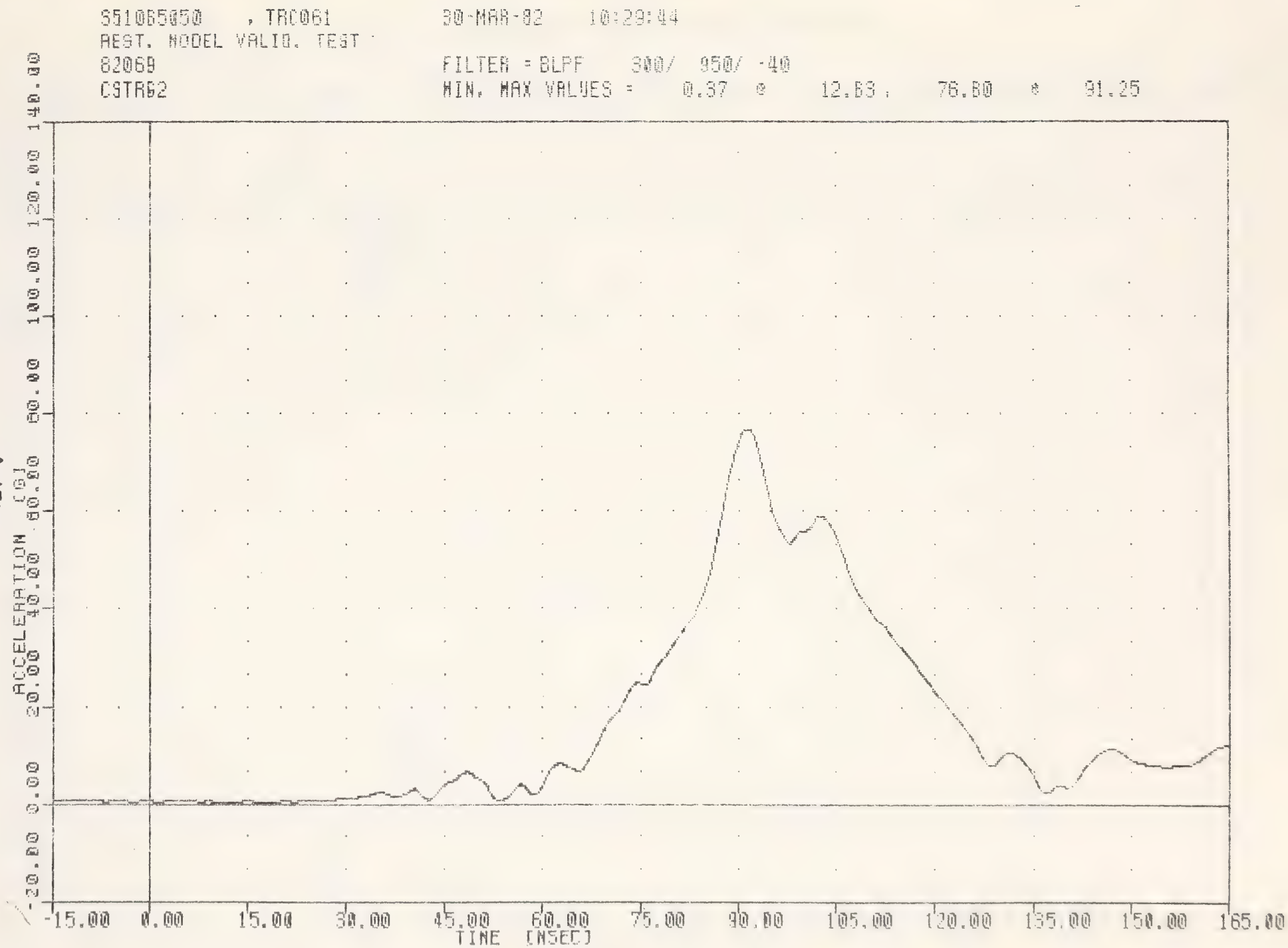
551085050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = BLPF 300/ 350/ -60
CSTY62 MIN, MAX VALUES = -1.73 @ 34.50 , 6.22 @ 91.75



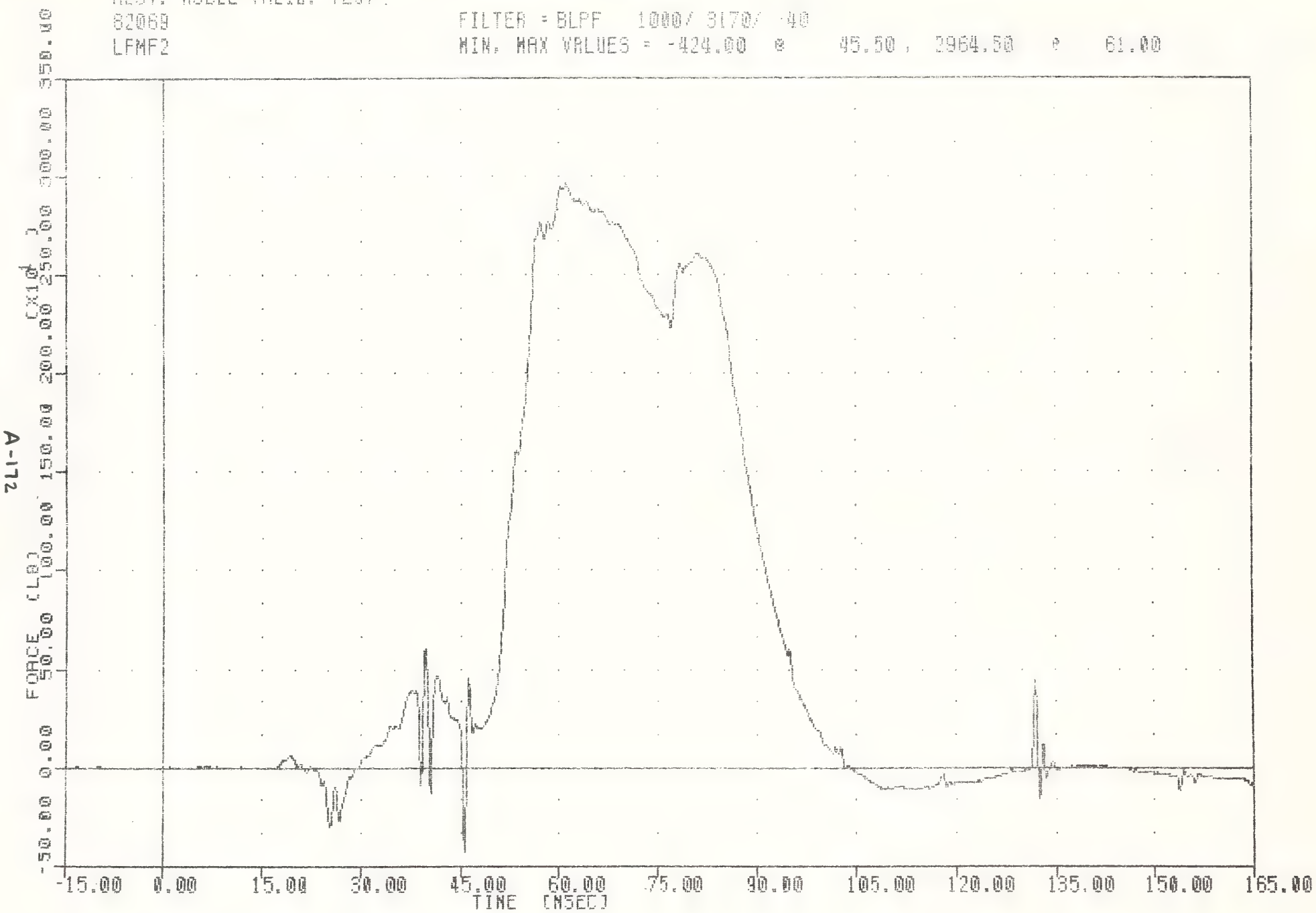
CHEST ACCELERATION Y AXIS PASSENGER



CHEST ACCELERATION Z AXIS PASSENGER

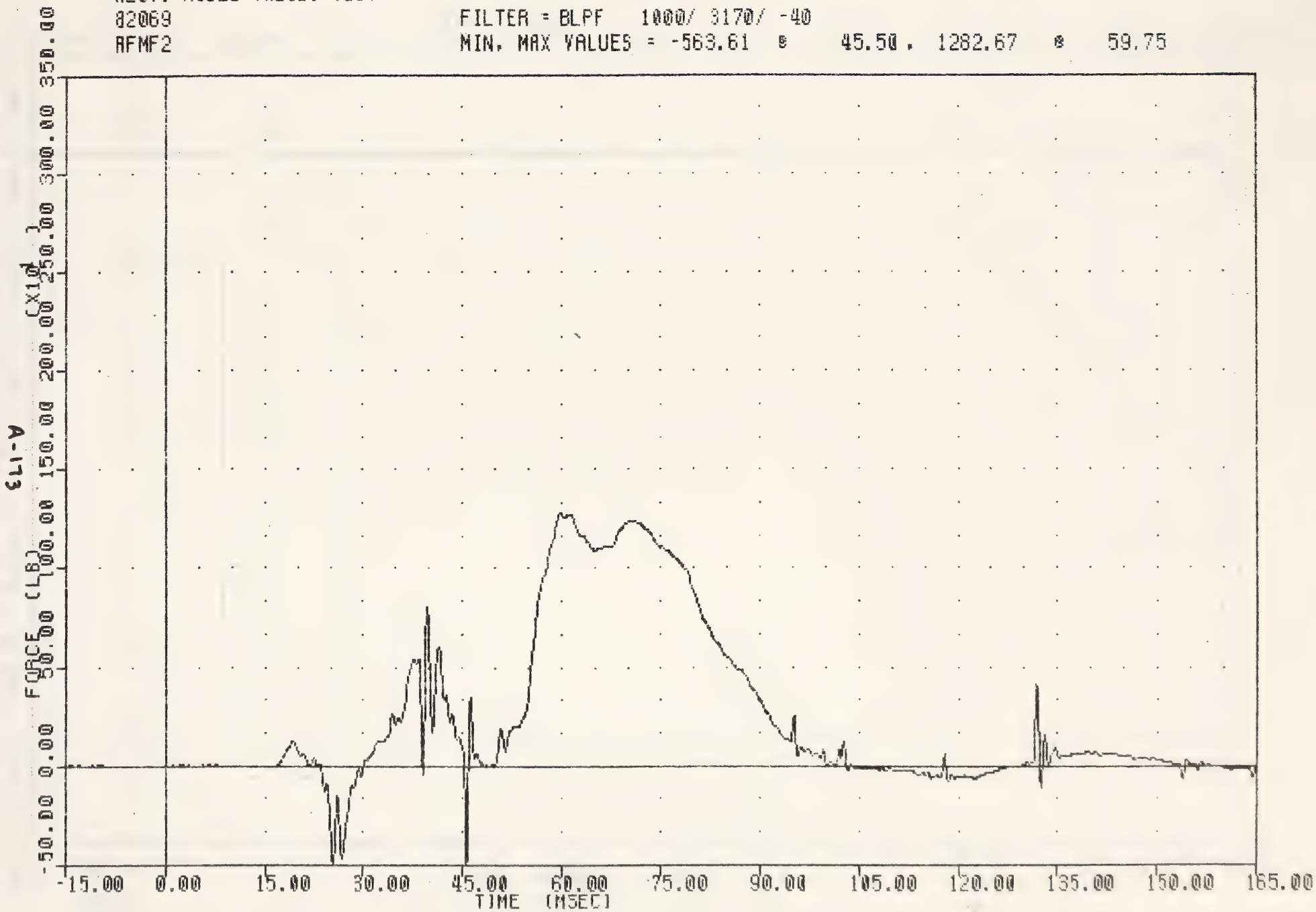


CHEST ACCELERATION RESULTANT PASSENGER



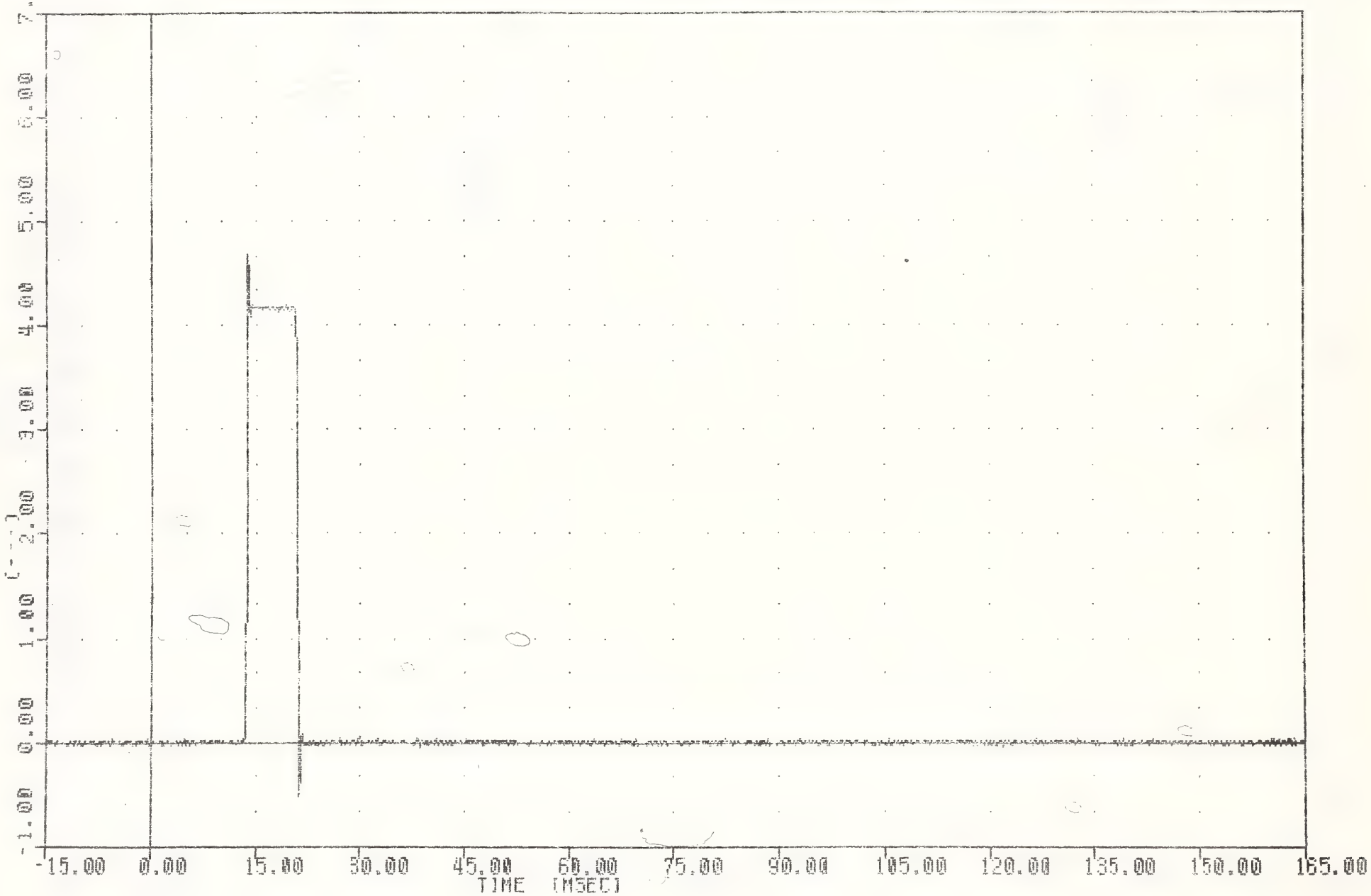
LEFT FEMUR FORCE PASSENGER

S51065050 . TRC061 30-MAR-82 12:26:32
REST. MODEL VALID. TEST
82069 FILTER = BLPF 1000/ 3170/ -40
RFMF2 MIN. MAX VALUES = -563.61 @ 45.50 , 1282.67 @ 59.75



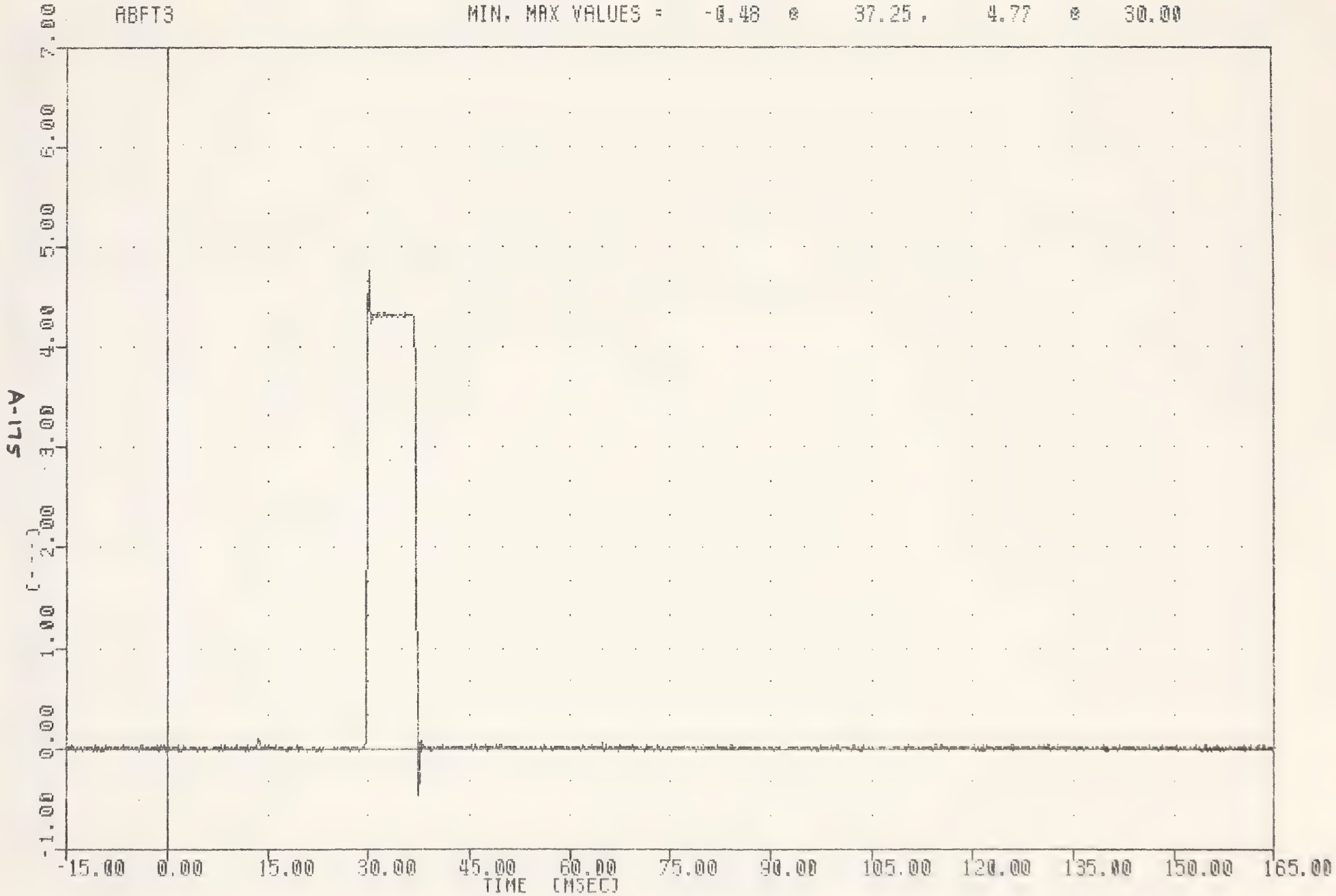
RIGHT FEMUR FORCE PASSENGER

S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = RLPF 1650/ 5214/ -40
ABFT2 MIN. MAX VALUES = -0.51 @ 21.13 , 4.67 @ 13.75



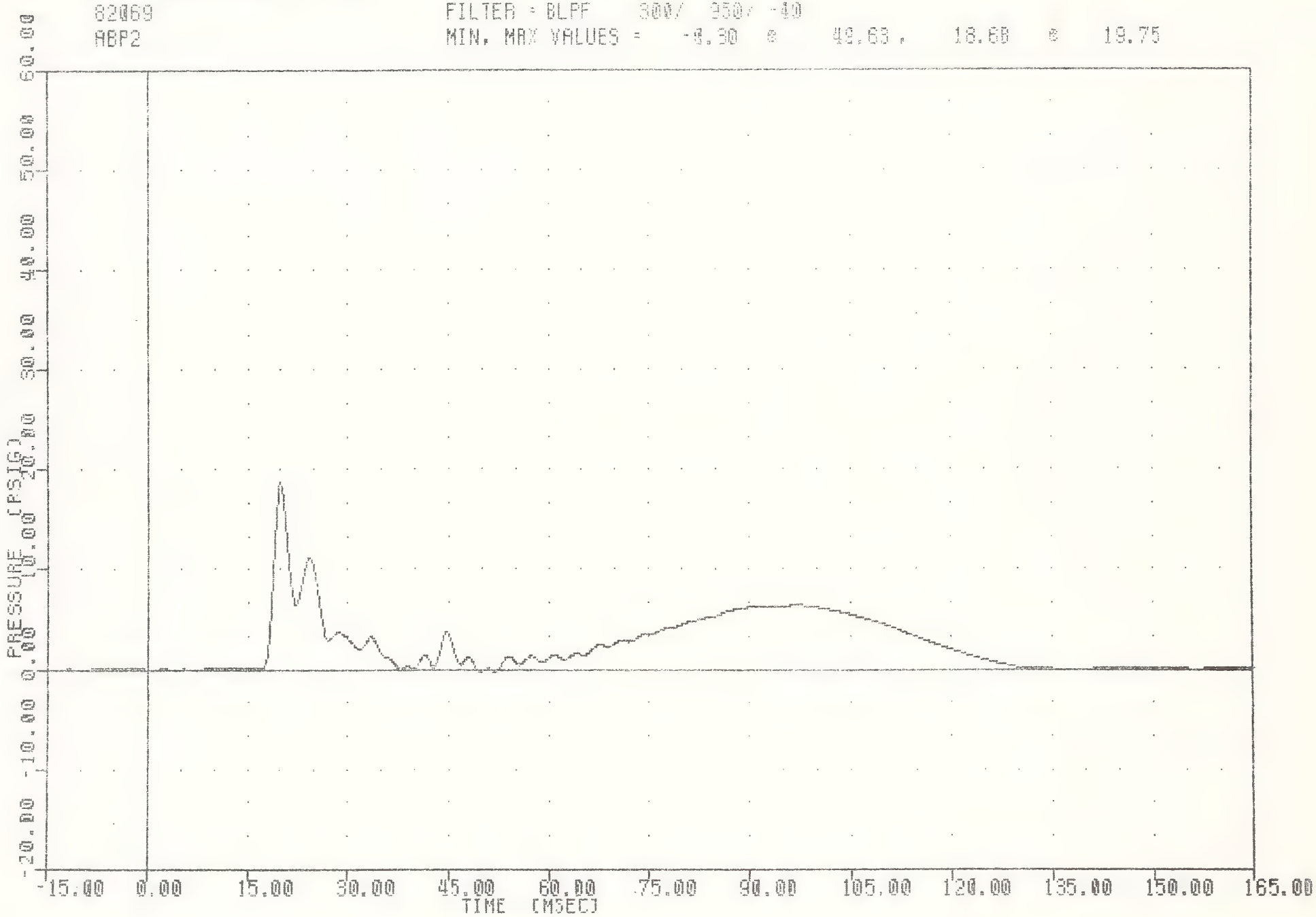
AIR BAG FIRING EVENT PASSENGER

S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST .
82069 FILTER = ALPF 1650/ 5214/ -40
ABFT3 MIN. MAX VALUES = -0.48 @ 37.25 , 4.77 @ 30.00



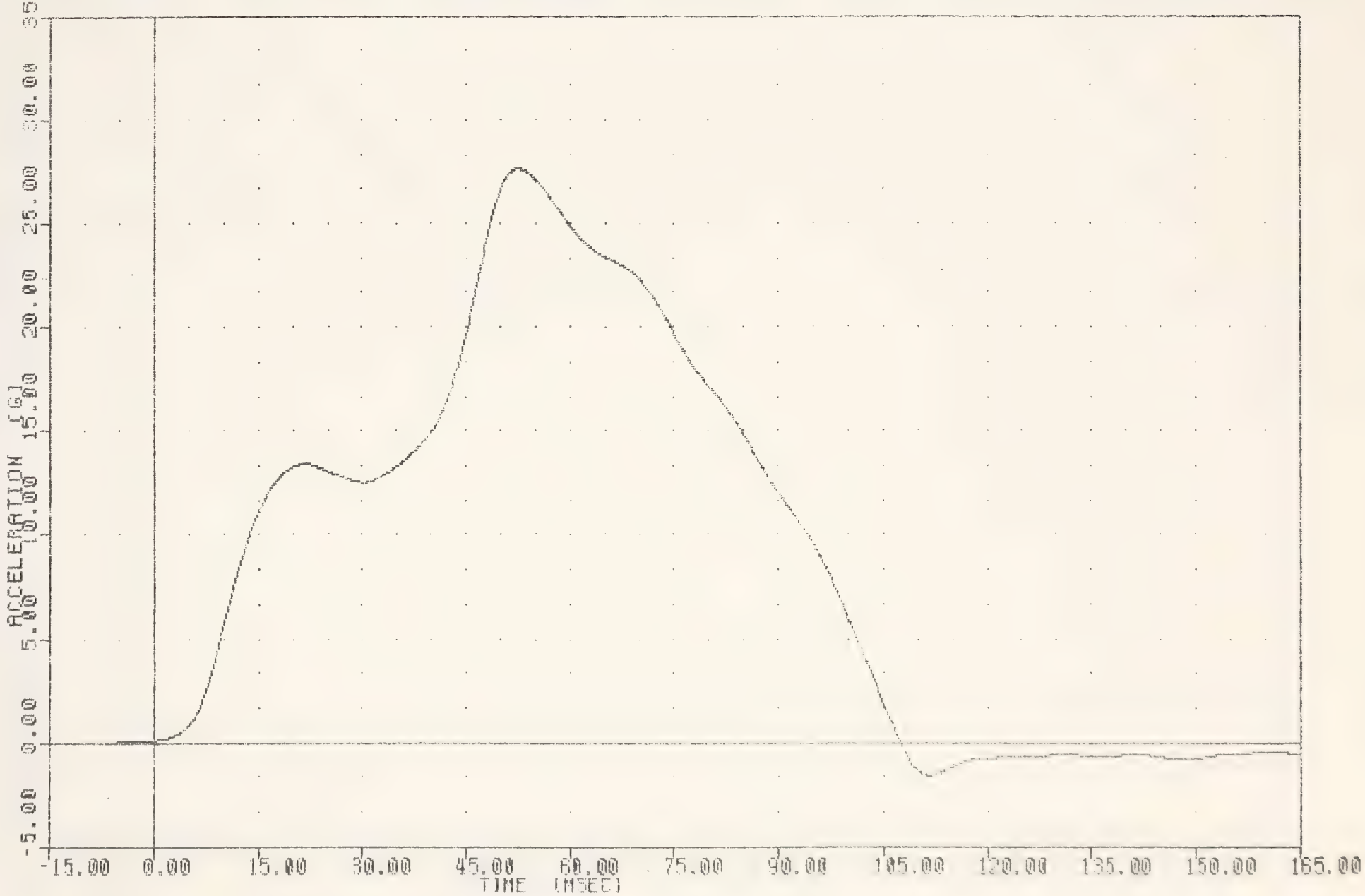
AIR BAG FIRING EVENT 3

S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST.
82069 FILTER = BLPF 300/ 950/ -40
ABP2 MIN. MAX VALUES = -8.30 @ 49.63 , 18.68 @ 19.75



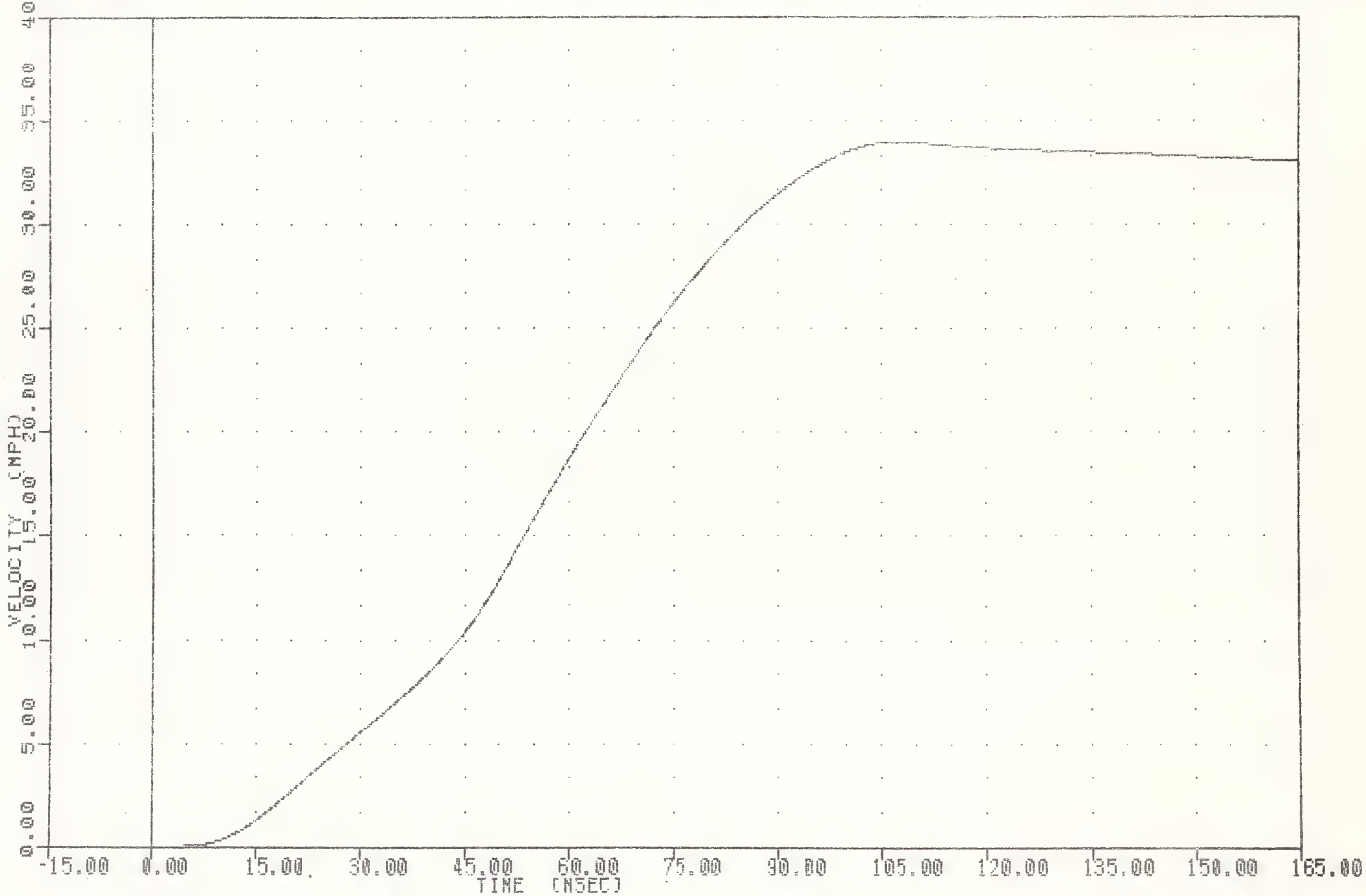
AIR BAG PRESSURE PASSENGER

S51065050 , TRC061 30-MAR-82 10:39:44
REST. MODEL VALID. TEST
82069 FILTER = BLPF 100/ 317/ -40
SLDXG MIN, MAX VALUES = -1.50 @ 111.50 , 27.61 @ 52.38



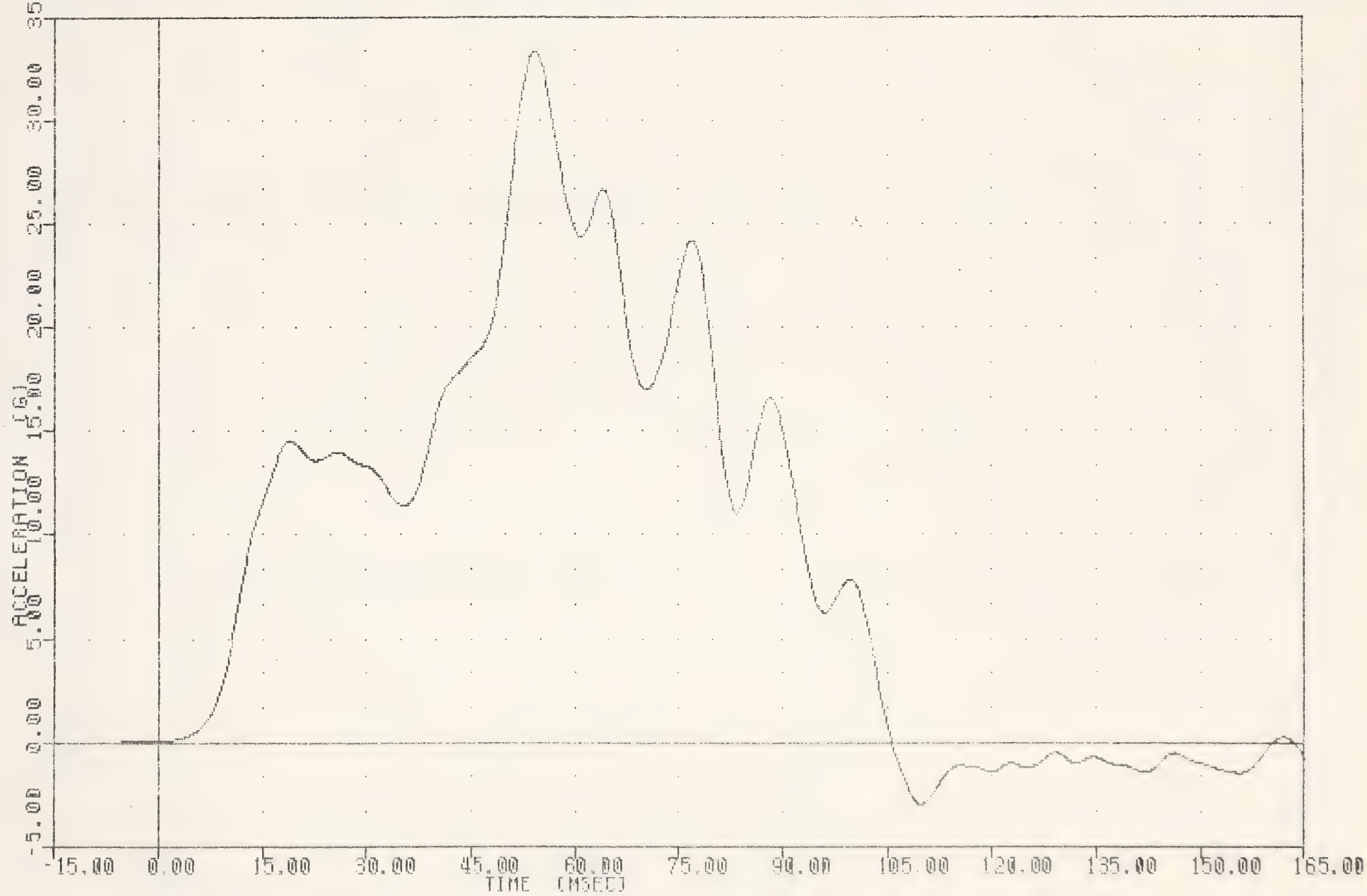
SLED ACCELERATION

S510B5050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = BLPF 100/ 317/ -40
SLDXV MIN. MAX VALUES = 0.00 @ -6.75 , 33.96 @ 107.25



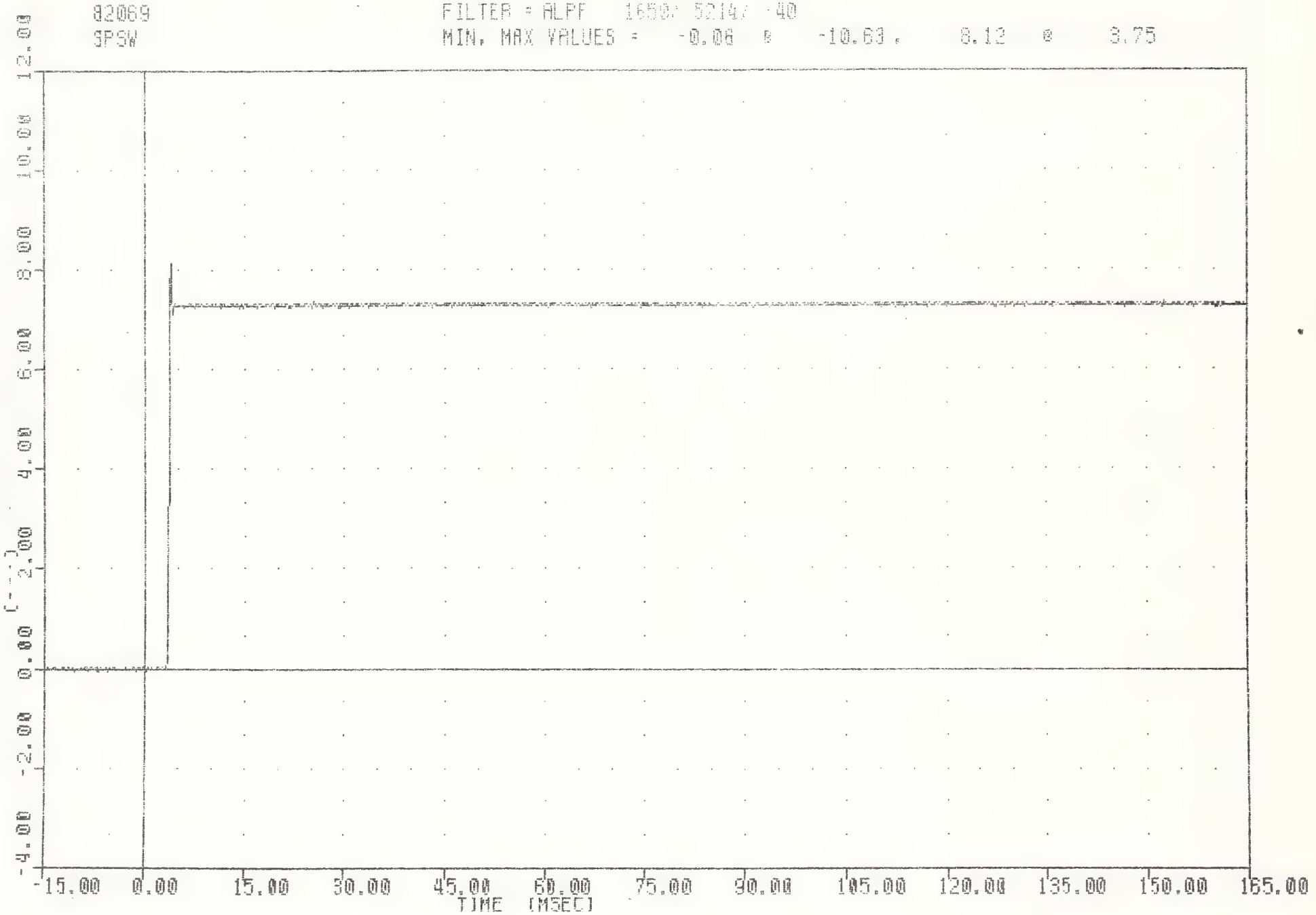
SLED VELOCITY IN MPH

S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = BLPF 100/ 517/ -40
FTUXG MIN. MAX VALUES = -2.99 @ 109.83 , 33.30 @ 54.13



FLOOR PAN TUNNEL ACCELERATION

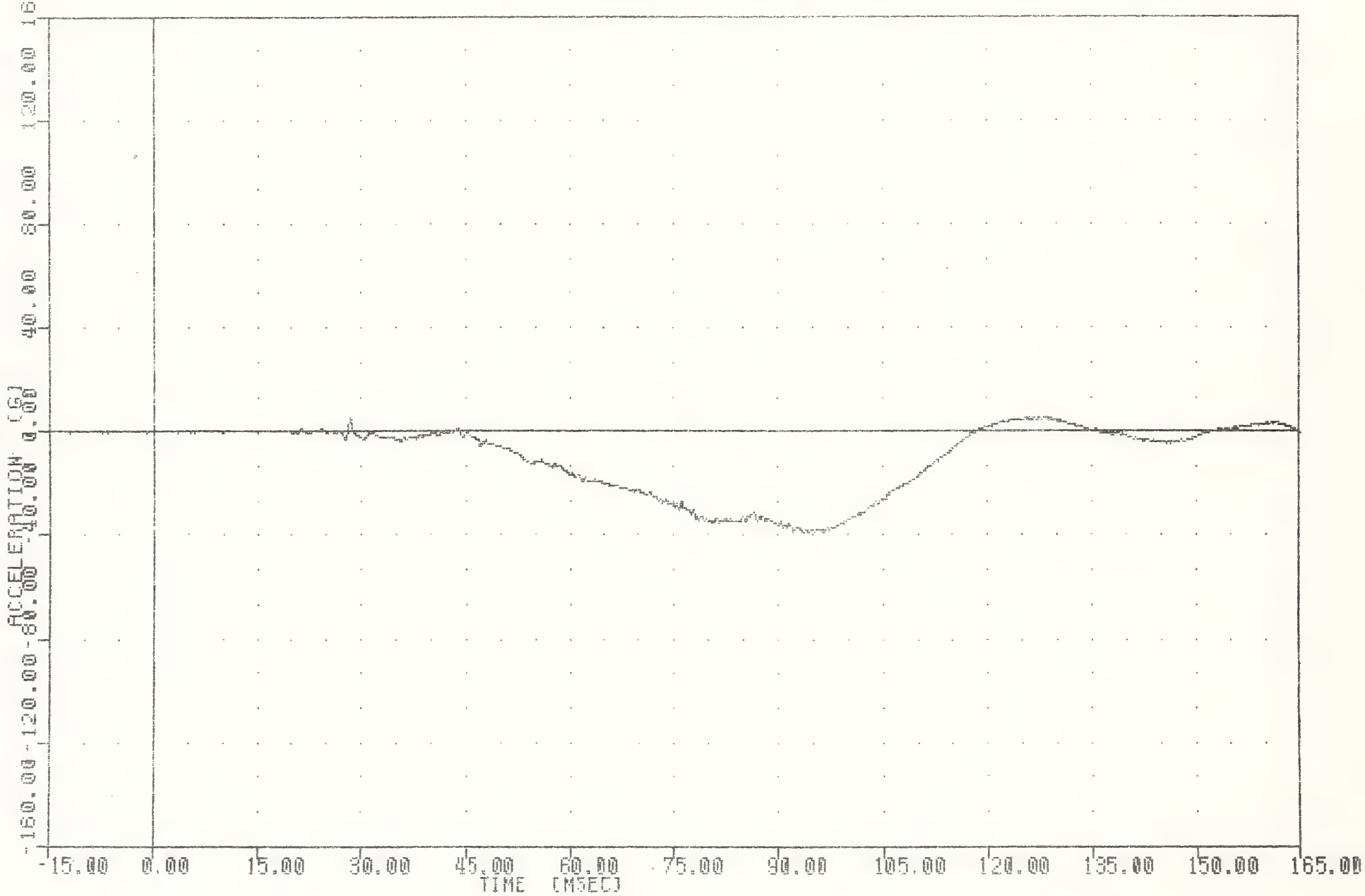
S51065050 , TRC061 30-MAR-82 10:29:44
REST. MODEL VALID. TEST
82069 FILTER = ALPF 1650: 5214: -40
SPSW MIN, MAX VALUES = -0.06 @ -10.63 , 8.12 @ 3.75



SLED POSITION SWITCH

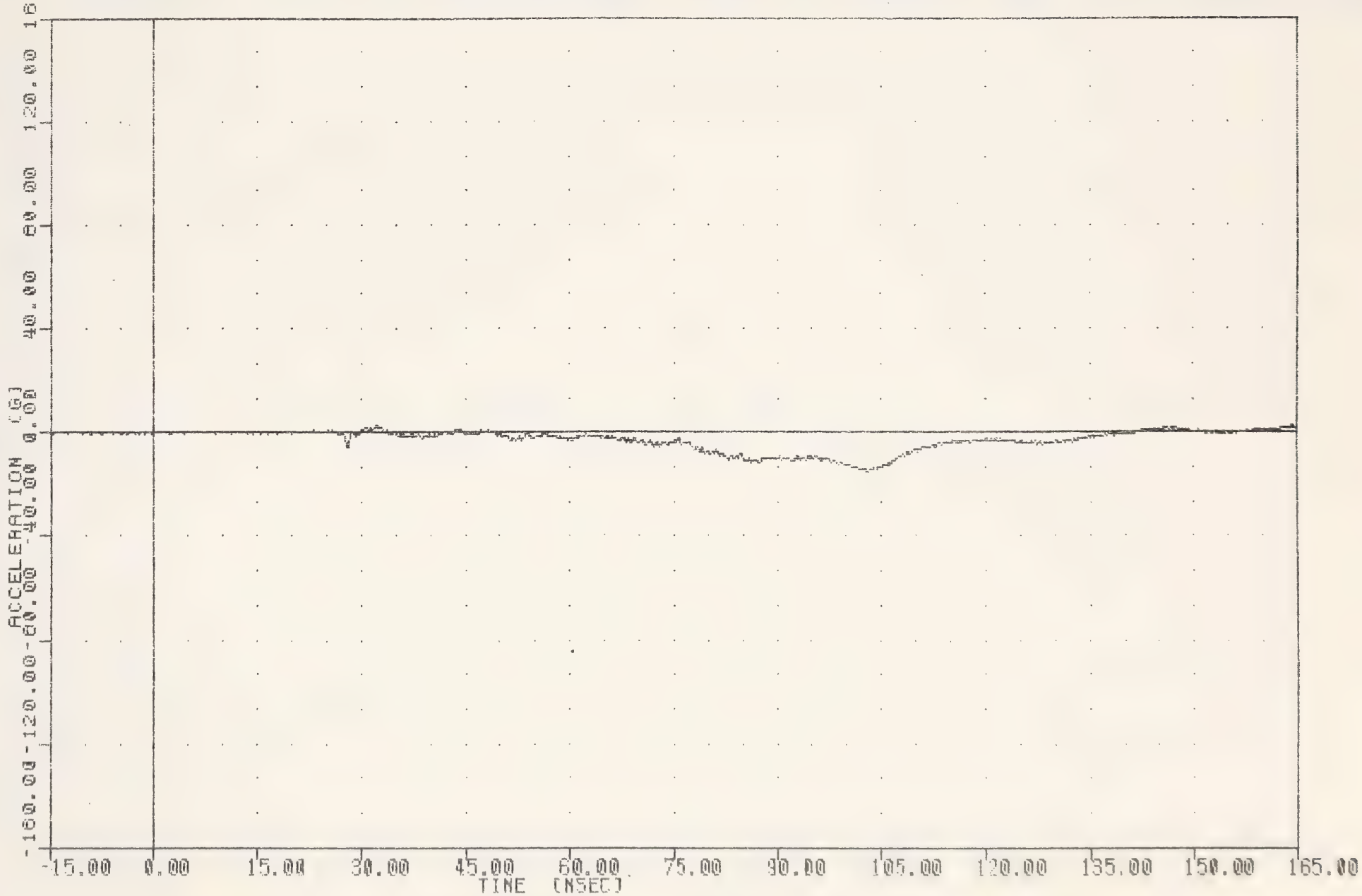
TEST NO. 7

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST.
82074 FILTER = ALPF 1650/ 5214/ -10
HEDXG1 MIN, MAX VALUES = -39.00 @ 94.25 , 5.47 @ 127.38



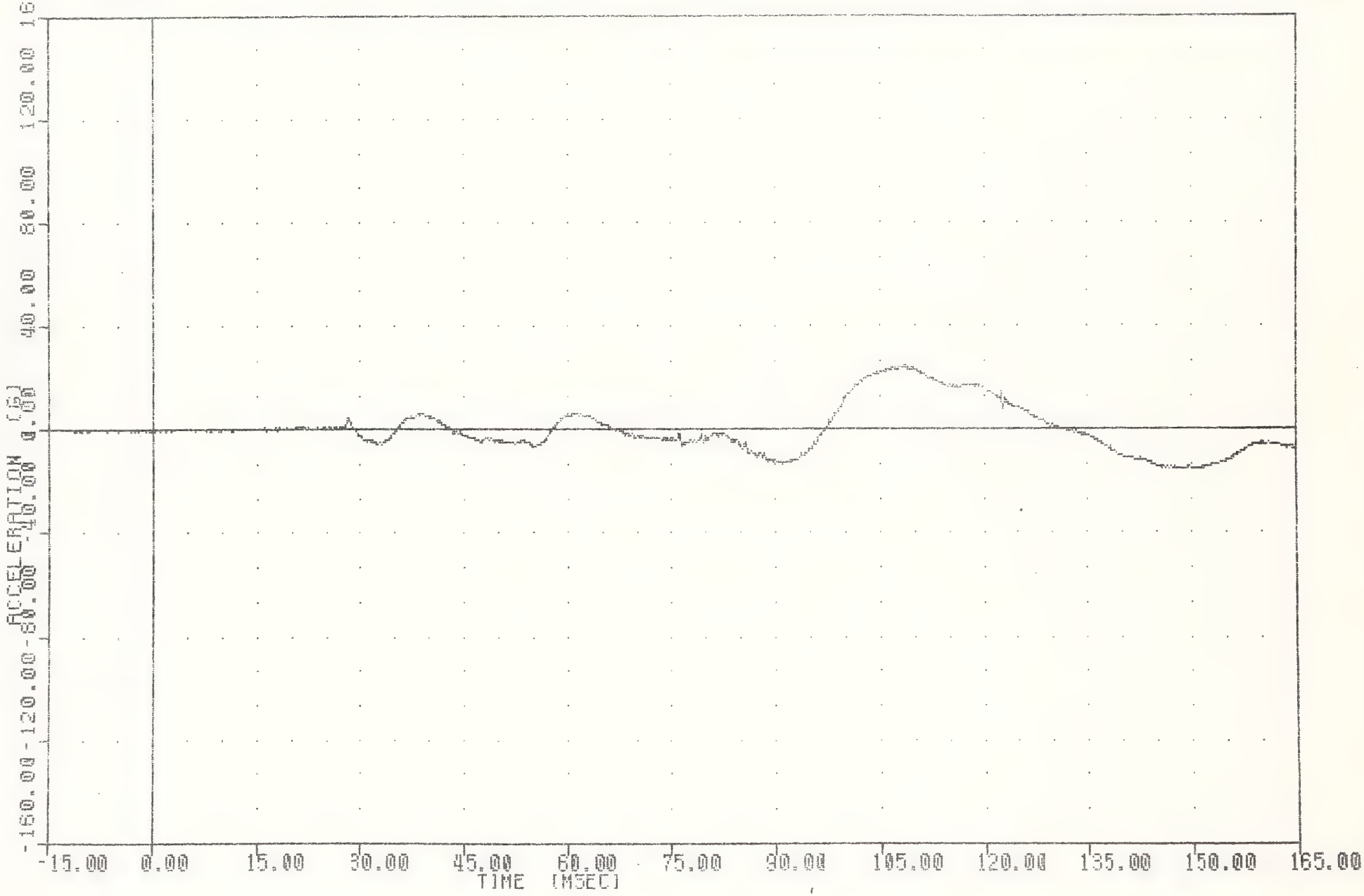
HEAD ACCELERATION X AXIS DRIVER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = ALPF 1650/ 5214/ -40
HEDY61 MIN. MAX VALUES = -15.12 @ 102.88 , 2.76 @ 165.00

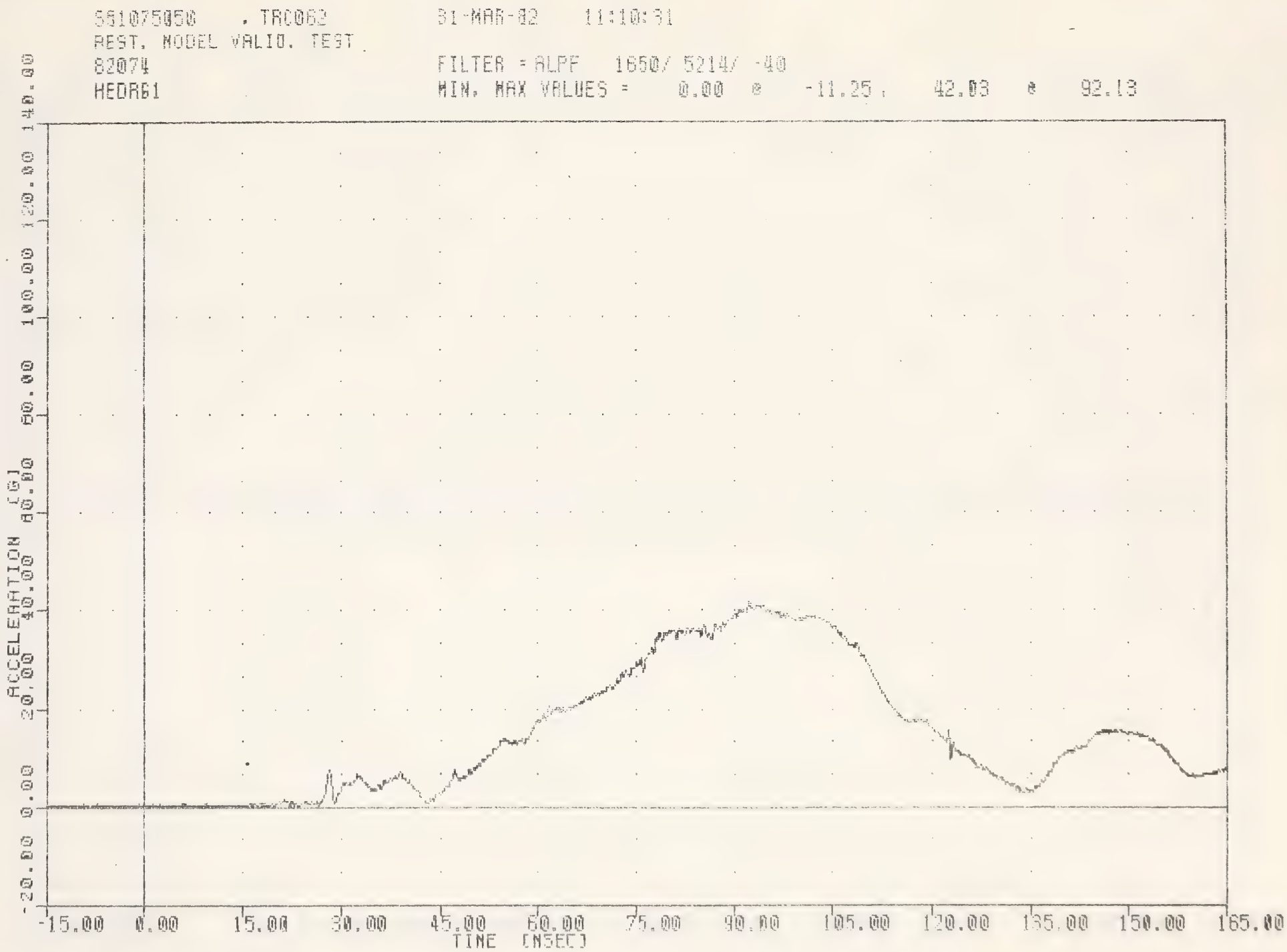


HEAD ACCELERATION Y AXIS DRIVER

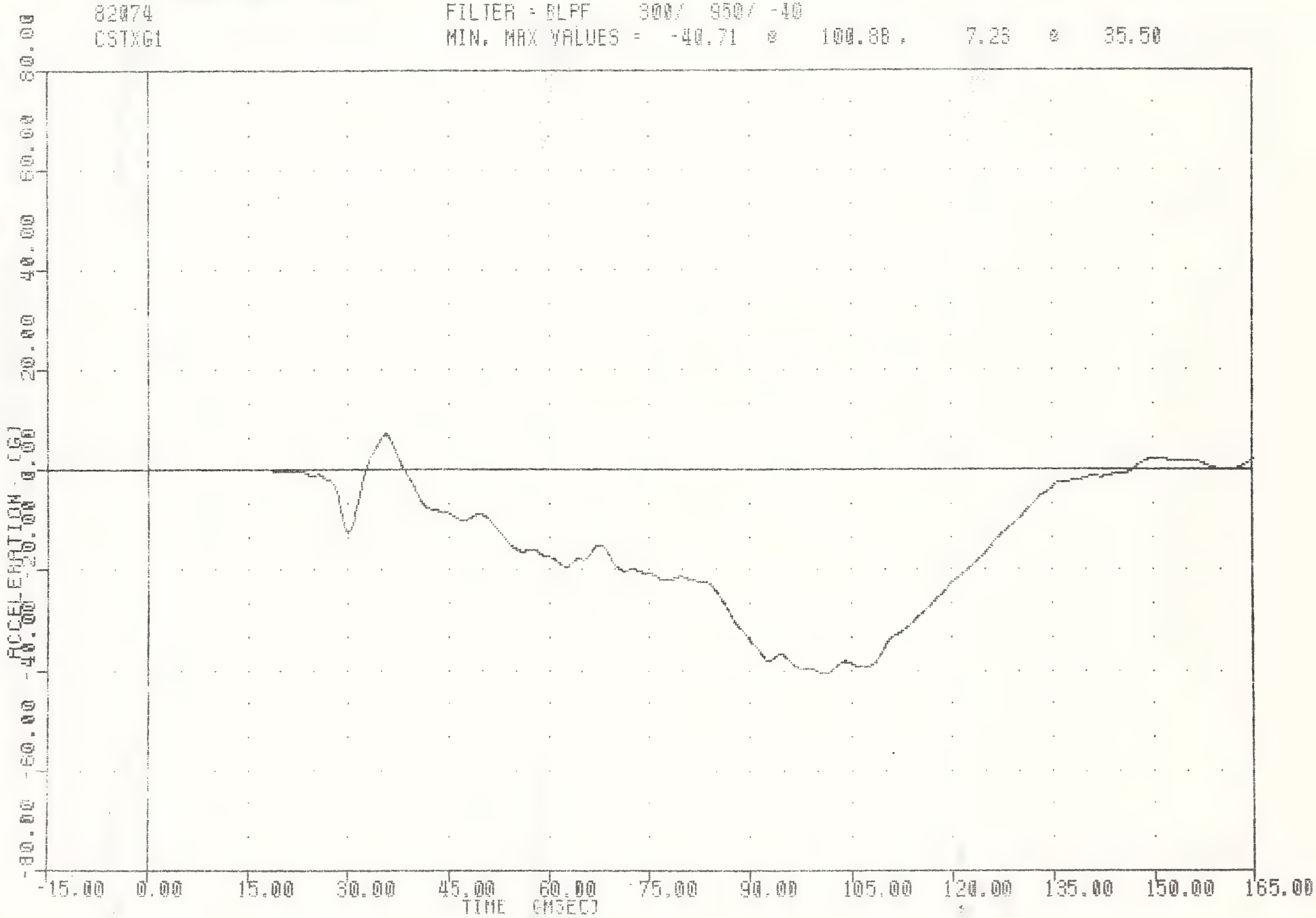
S51075050 . TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = ALPF 1650/ 5214/ -40
HEDZG1 MIN, MAX VALUES = -15.15 @ 146.75 , 25.20 @ 108.50



HEAD ACCELERATION Z AXIS DRIVER

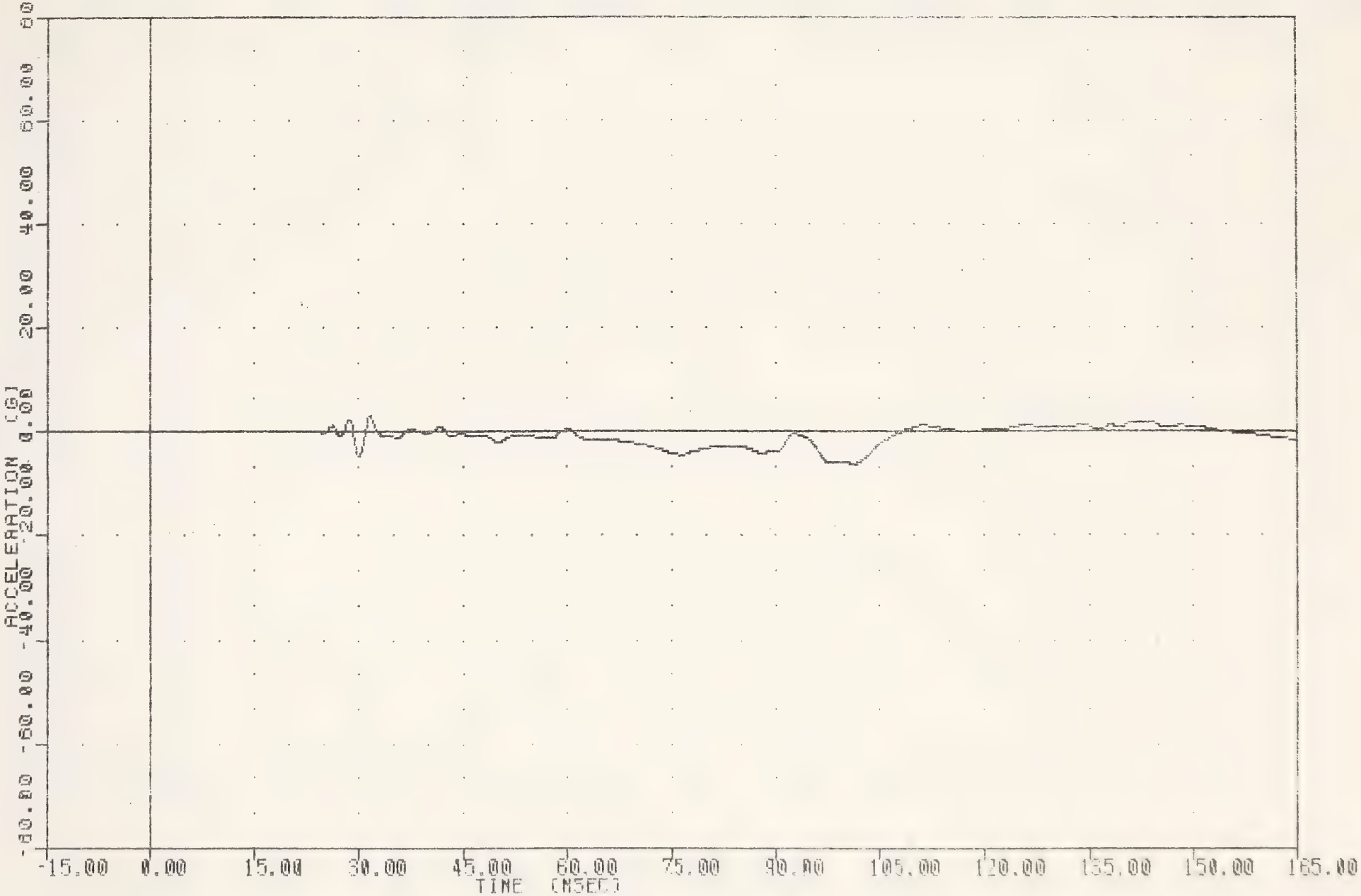


HEAD ACCELERATION RESULTANT DRIVER



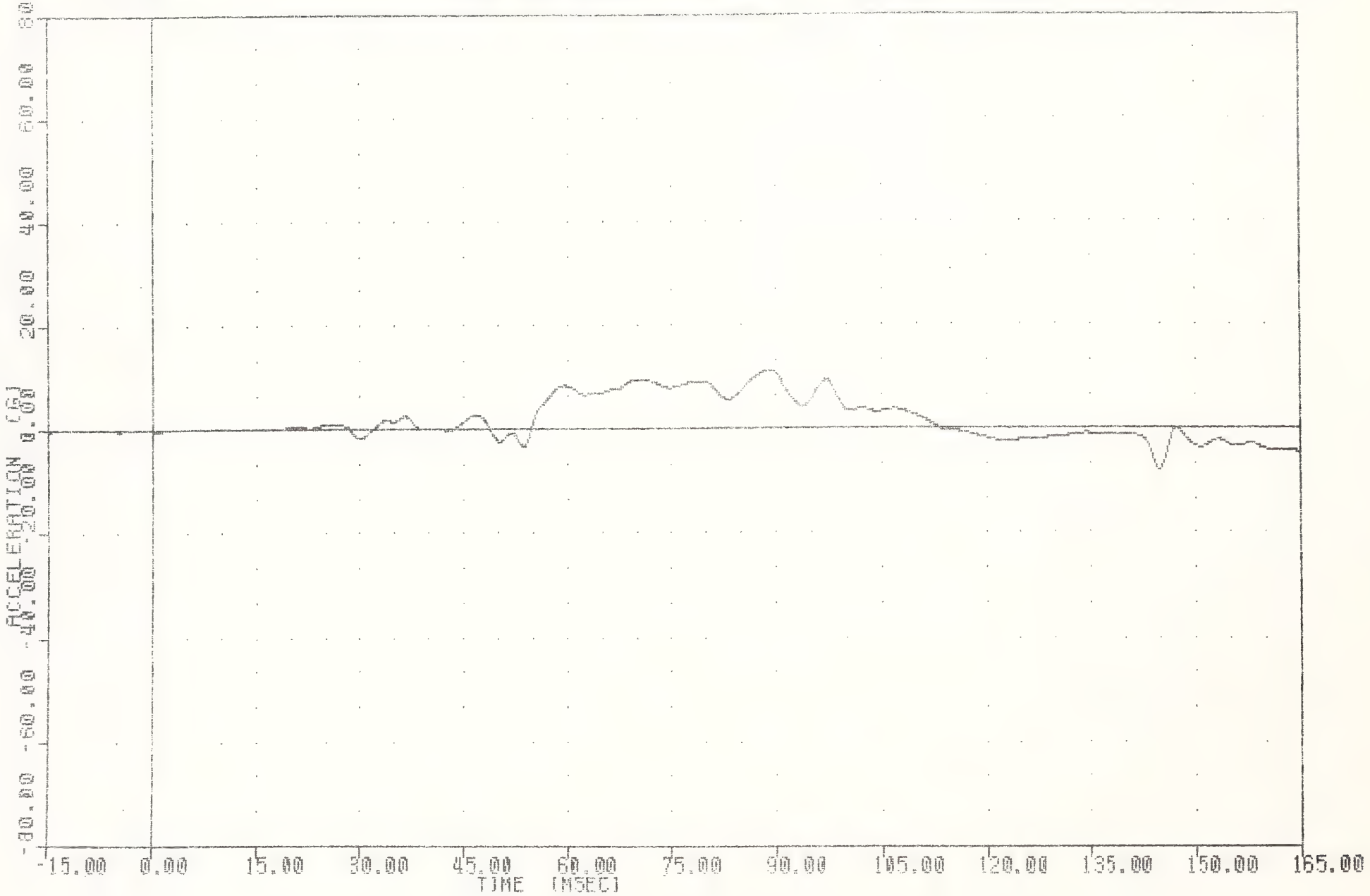
CHEST ACCELERATION X AXIS DRIVER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = BLPF 300/ 950/ -40
CSTY61 MIN. MAX VALUES = -6.15 @ 101.13 , 2.98 @ 31.63



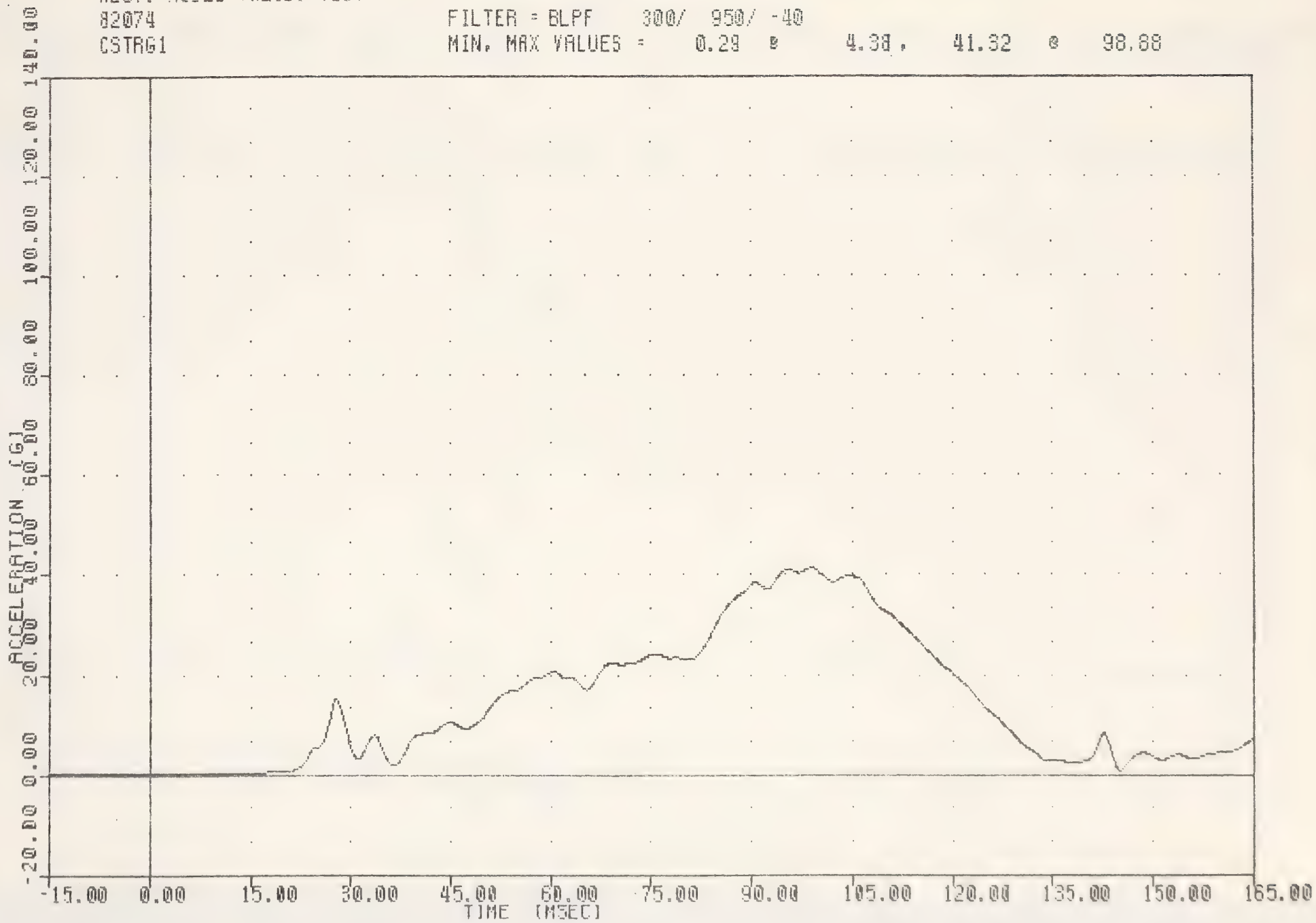
CHEST ACCELERATION Y AXIS DRIVER

S51075050 , TRC062 31-MAR-82 11:10:51
REST. MODEL VALID. TEST
82074 FILTER = BLPF 300/ 900/ -60
CSTZG1 MIN. MAX VALUES = -8.03 @ 144.75 , 11.30 @ 88.88



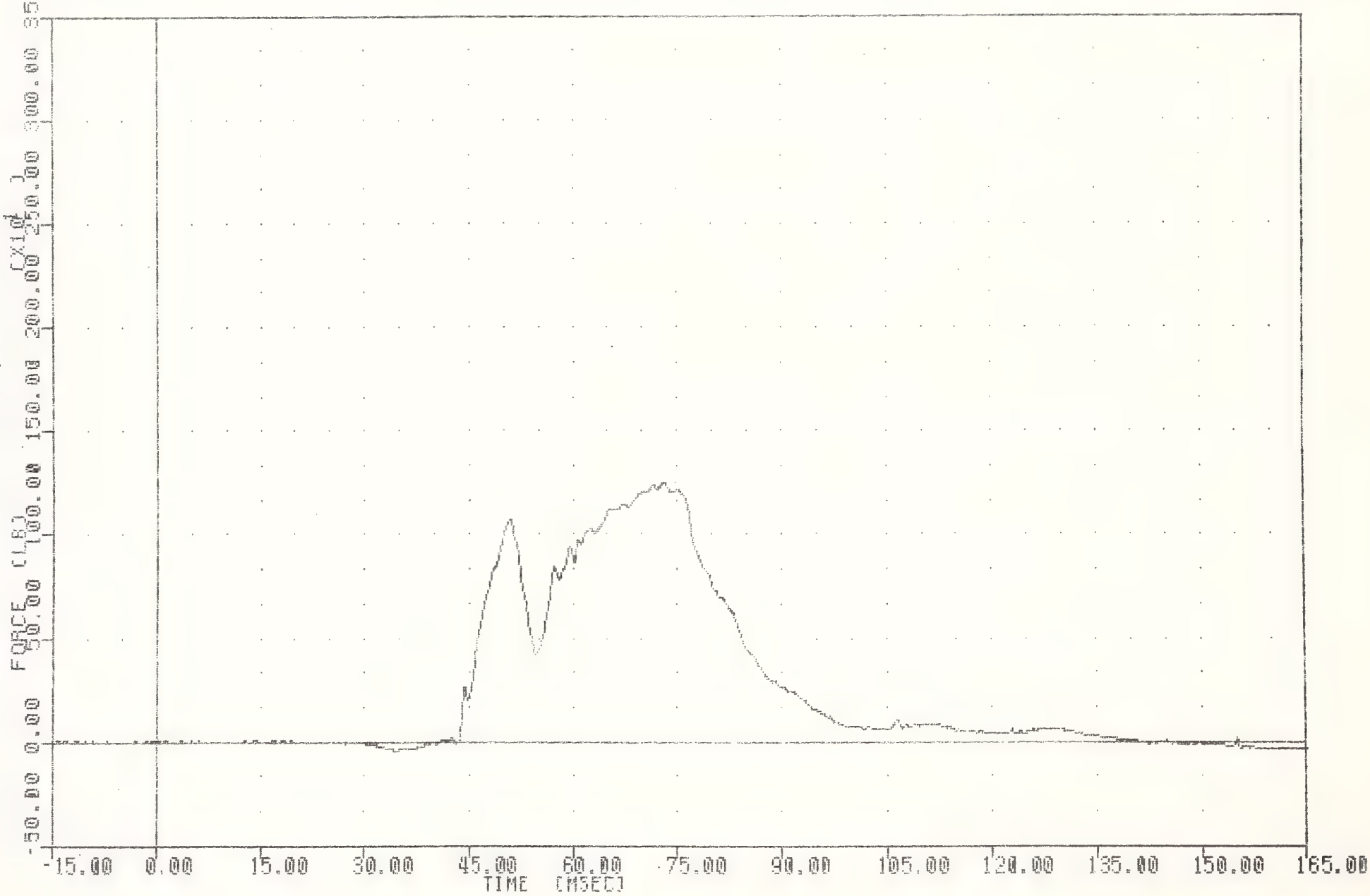
CHEST ACCELERATION Z AXIS DRIVER

S51075050 , TRC062 31-MAR-82 13:10:10
REST. MODEL VALID. TEST
82074 FILTER = BLPF 300/ 950/ -40
CSTRG1 MIN. MAX VALUES = 0.29 @ 4.38 , 41.32 @ 98.88



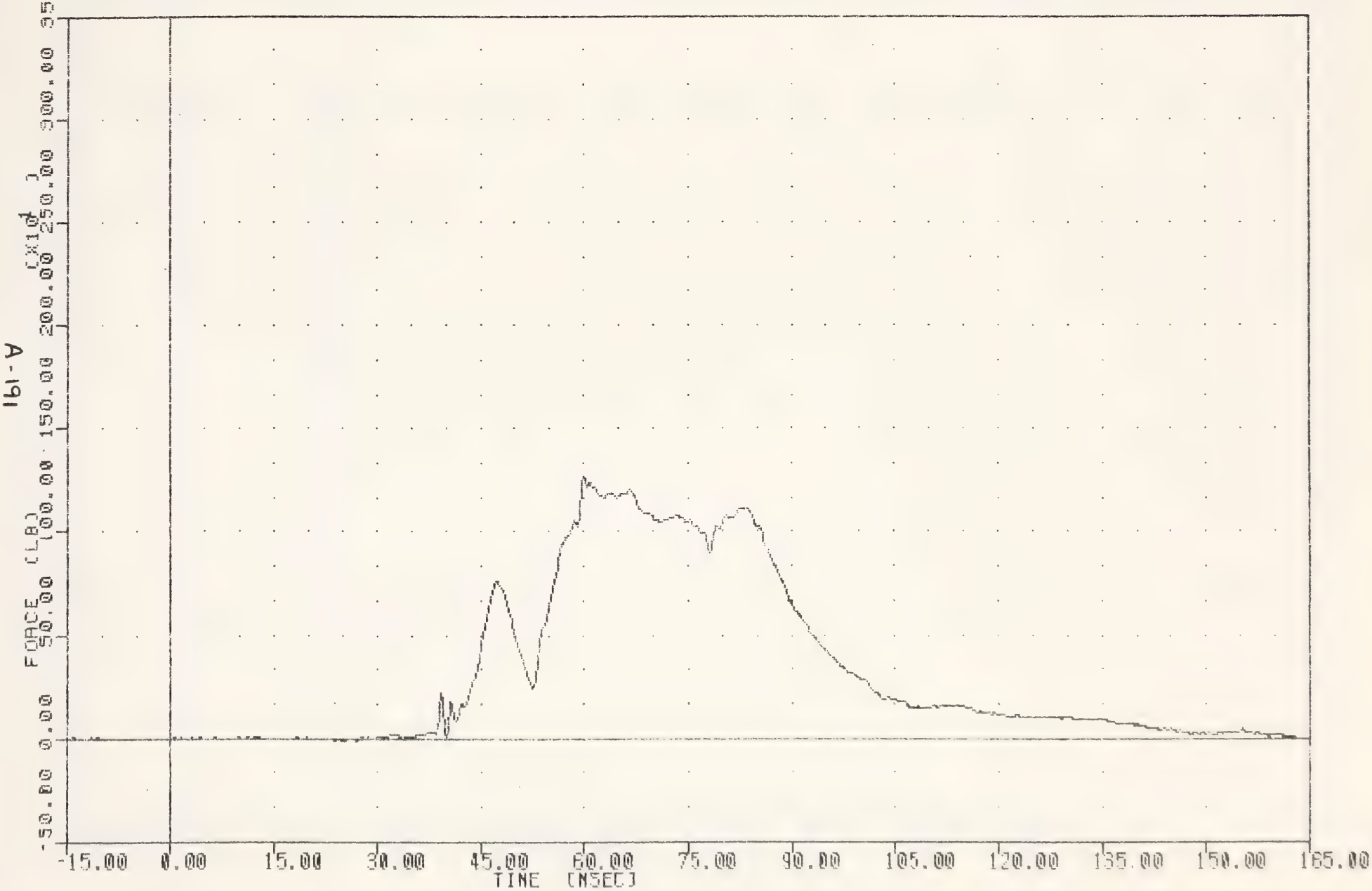
CHEST ACCELERATION RESULTANT DRIVER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = BLPF 1000/ 3170/ -40
LFNF1 MIN, MAX VALUES = -43.05 @ 34.50 , 1248.83 @ 72.88

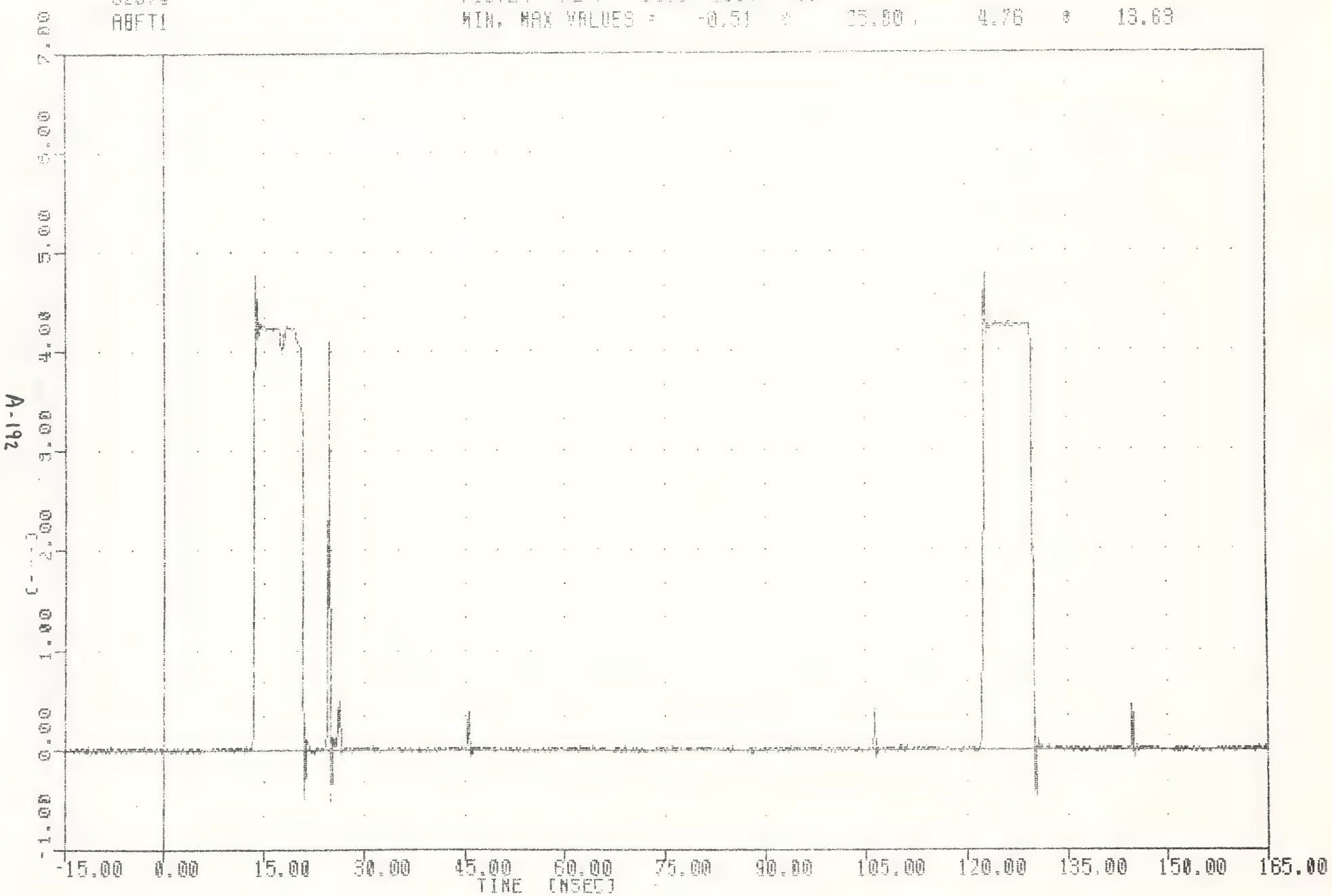


LEFT FEMUR FORCE DRIVER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = BLPF 1000/ 3170/ 40
RFMF1 MIN, MAX VALUES = -11.25 @ 23.75 , 1270.52 @ 59.88

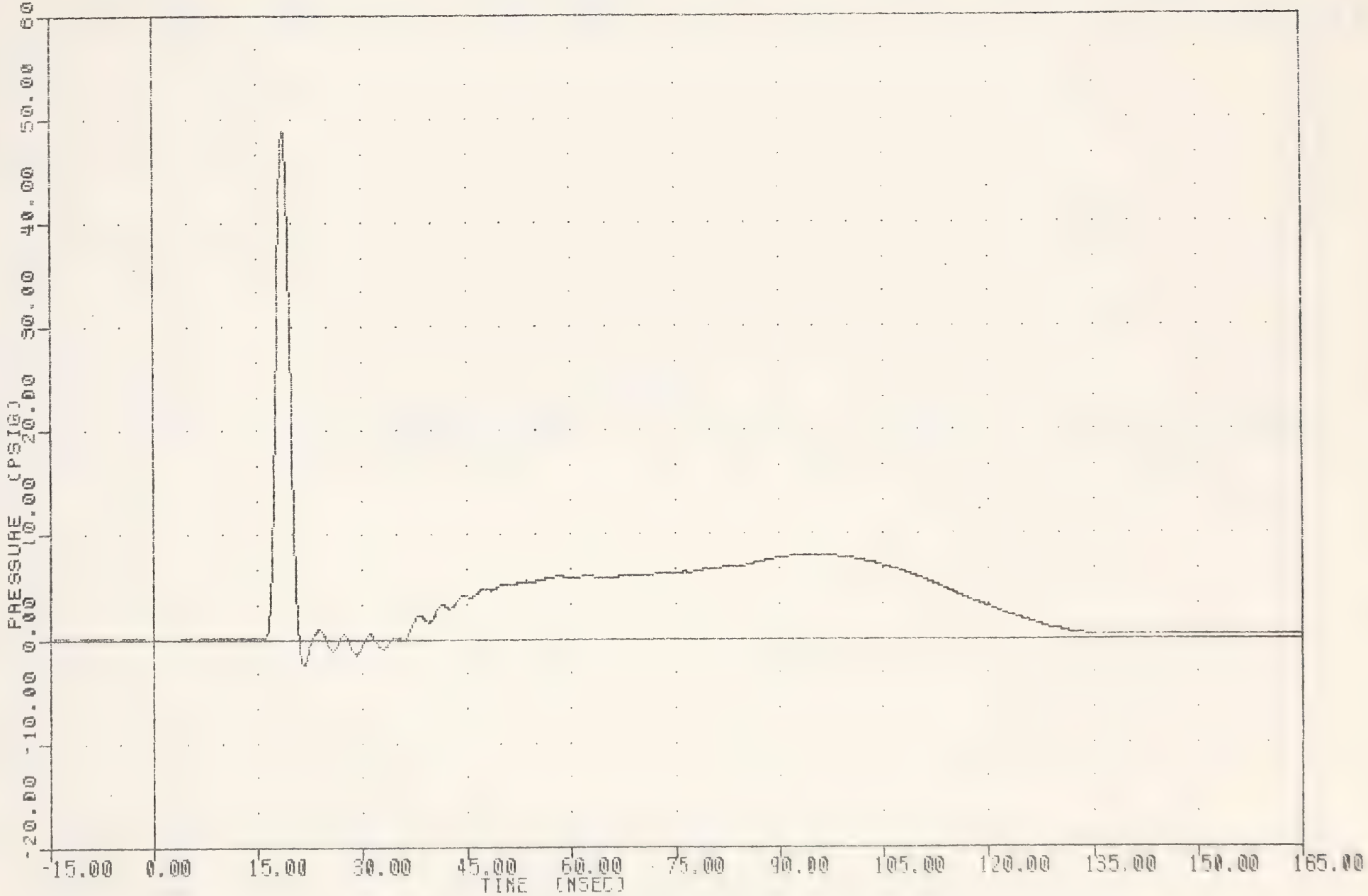


RIGHT FEMUR FORCE DRIVER



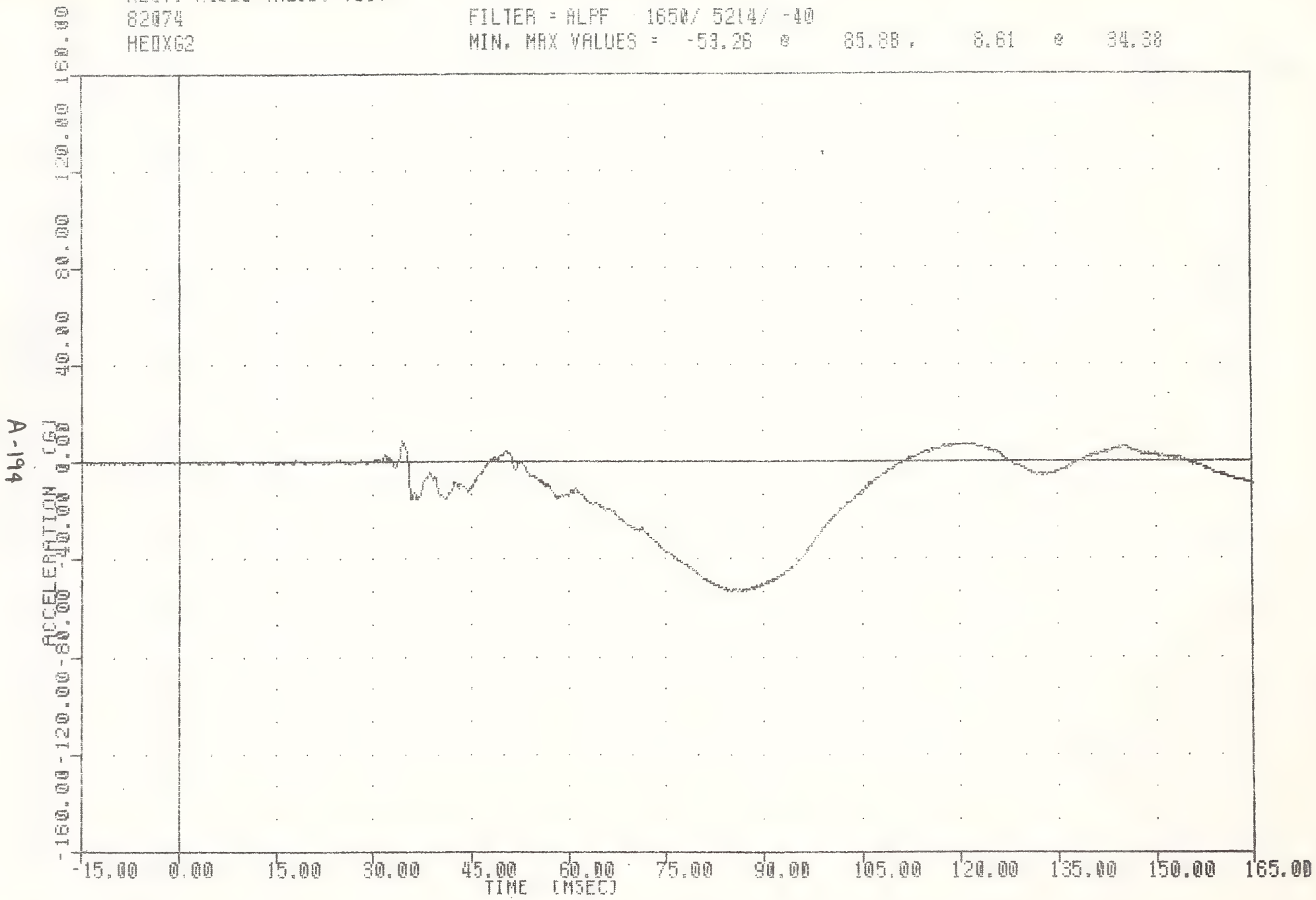
AIR BAG FIRING EVENT DRIVER

S51075050 , TRC062 31-MAR-82 13:10:10
AEST. MODEL VALID. TEST-
82074 FILTER = BLPF 300/ 950/ -40
ABP1 MIN, MAX VALUES = -2.42 @ 21.50 , 48.96 @ 18.63



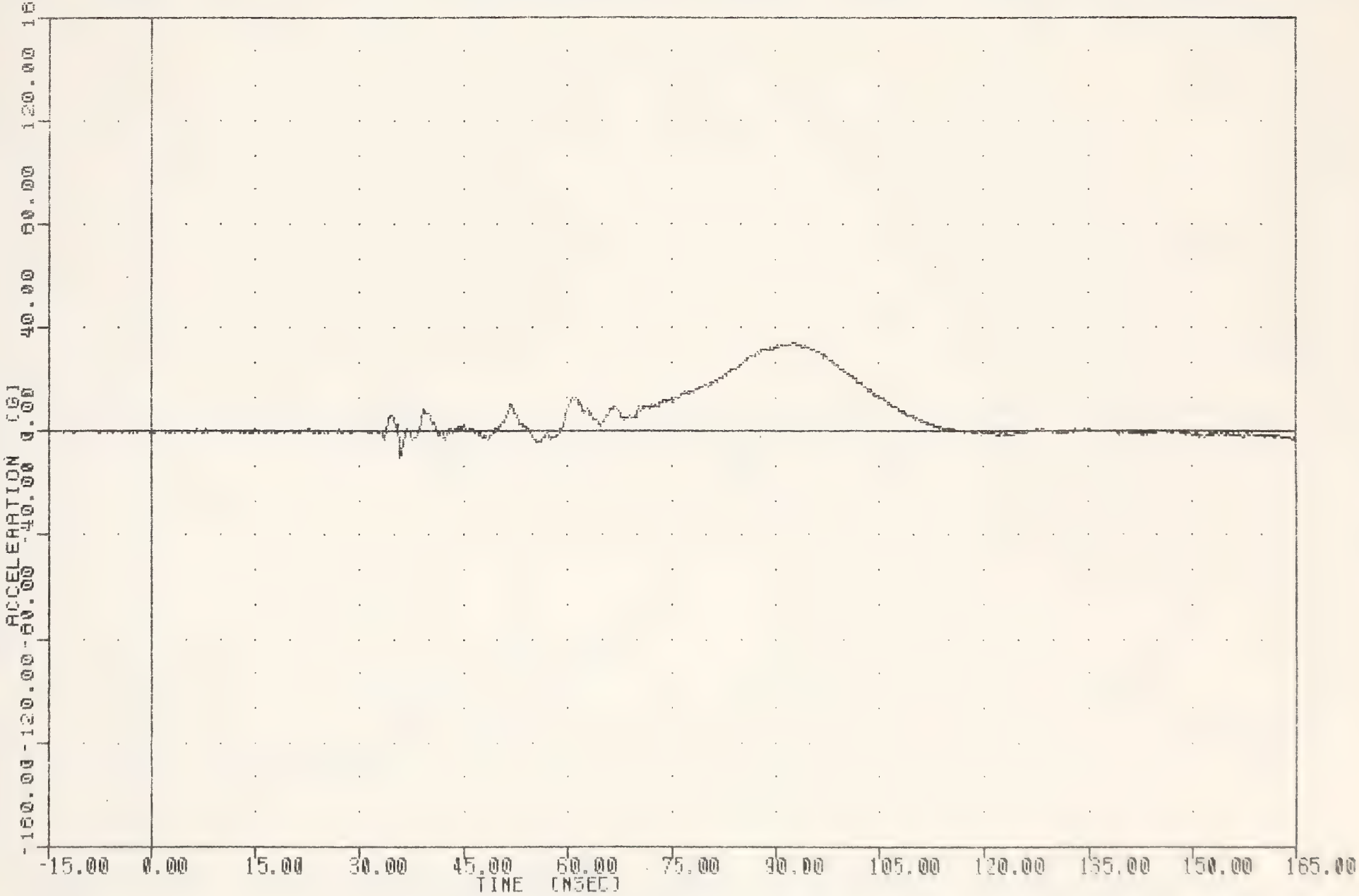
AIR BAG PRESSURE DRIVER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = ALPF 1650/ 5214/ -40
HEDXG2 MIN, MAX VALUES = -53.28 @ 85.88 , 8.61 @ 34.38

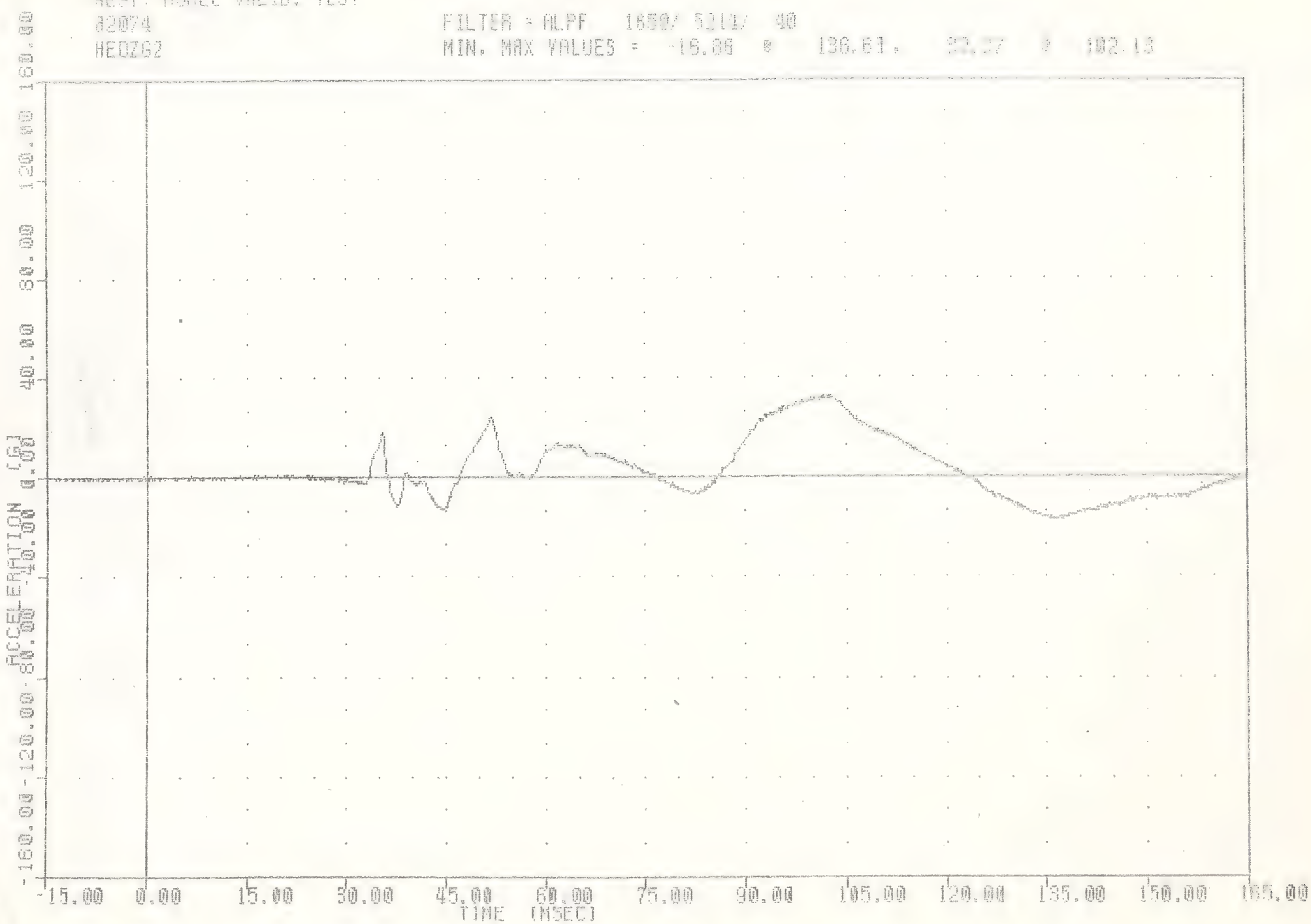


HEAD ACCELERATION X AXIS PASSENGER

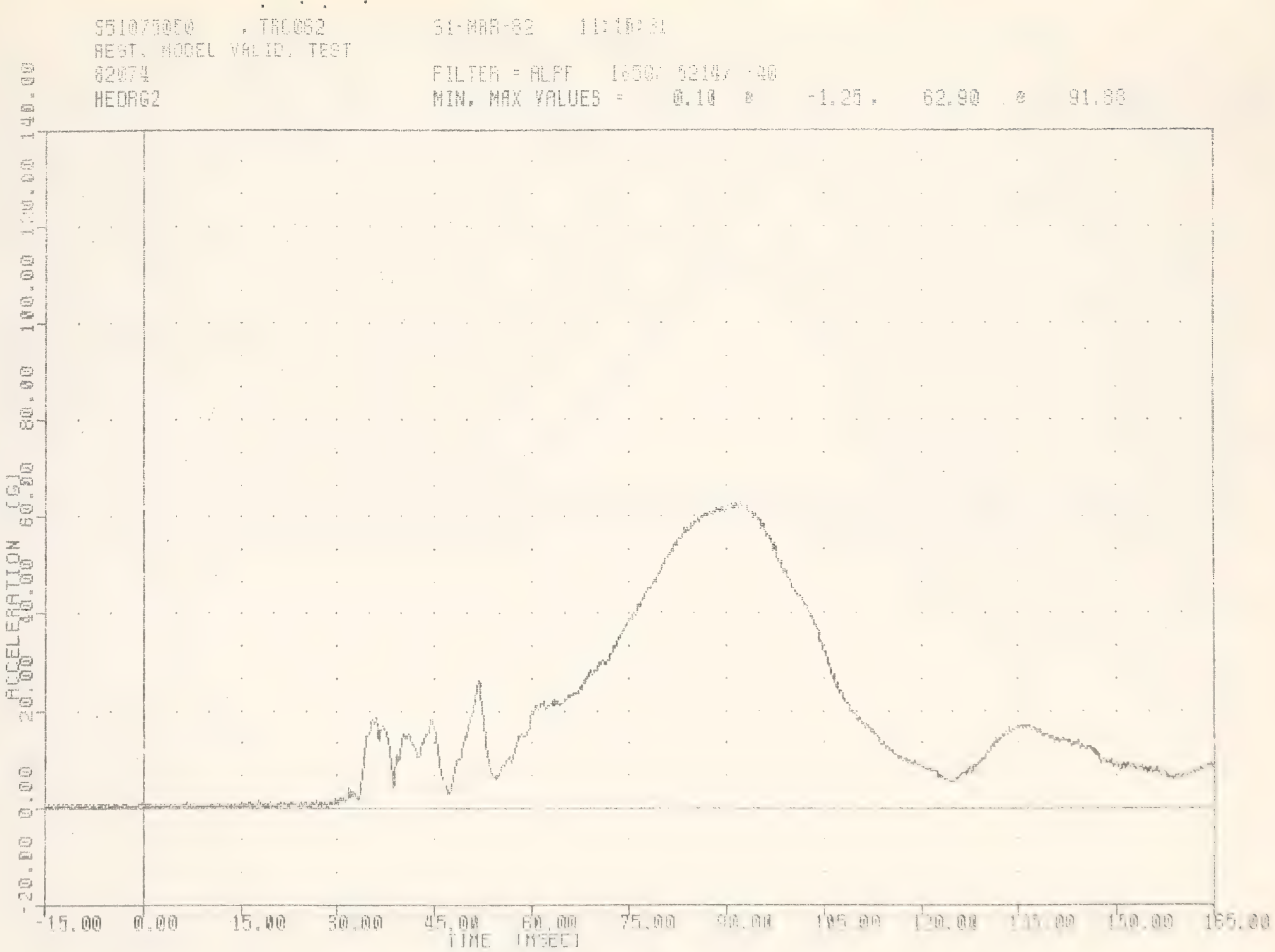
S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = ALPF 1650/ 5214/ -40
HEDY62 MIN. MAX VALUES = -10.33 @ 95.88 , 34.11 @ 92.38



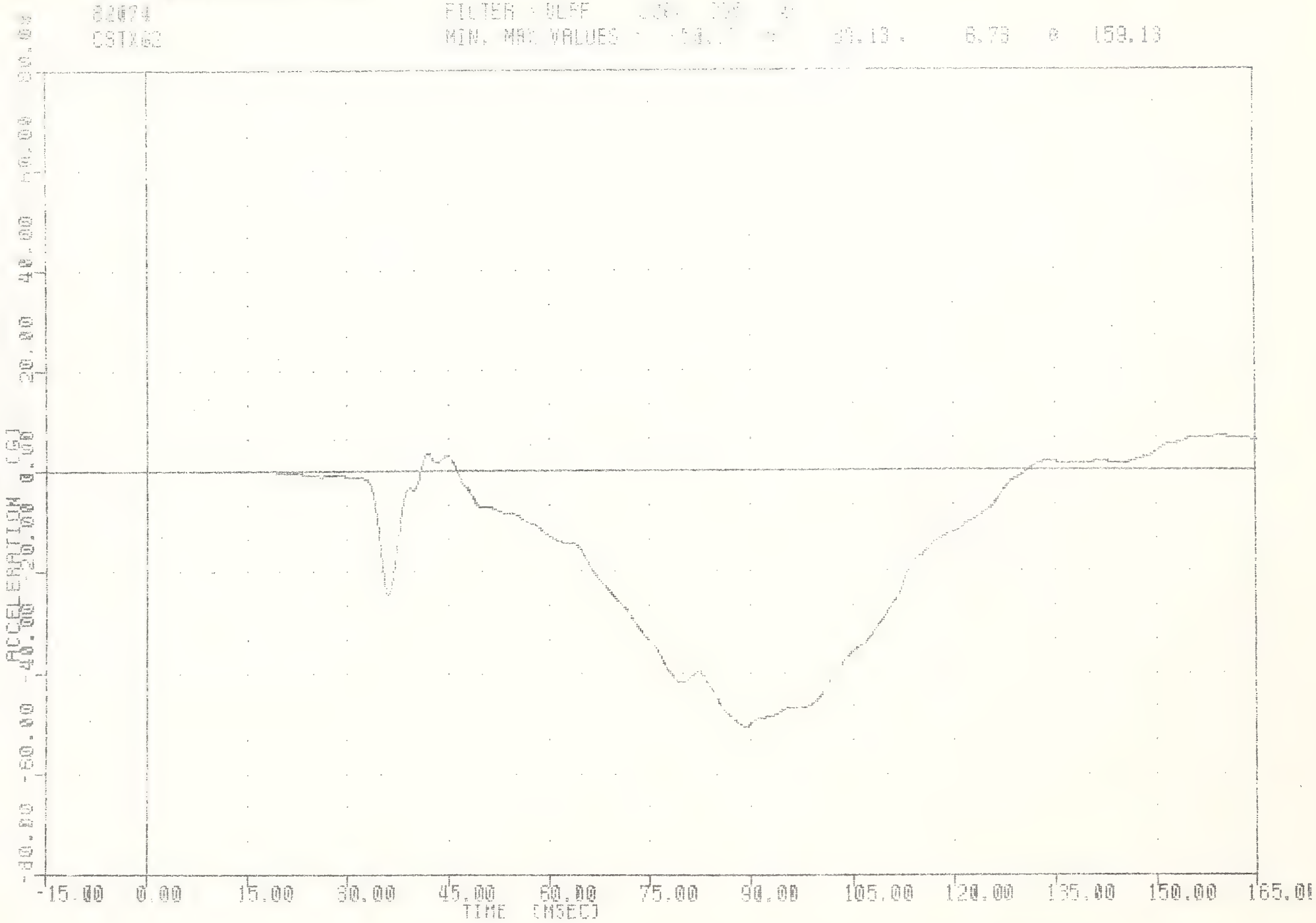
HEAD ACCELERATION Y AXIS PASSENGER



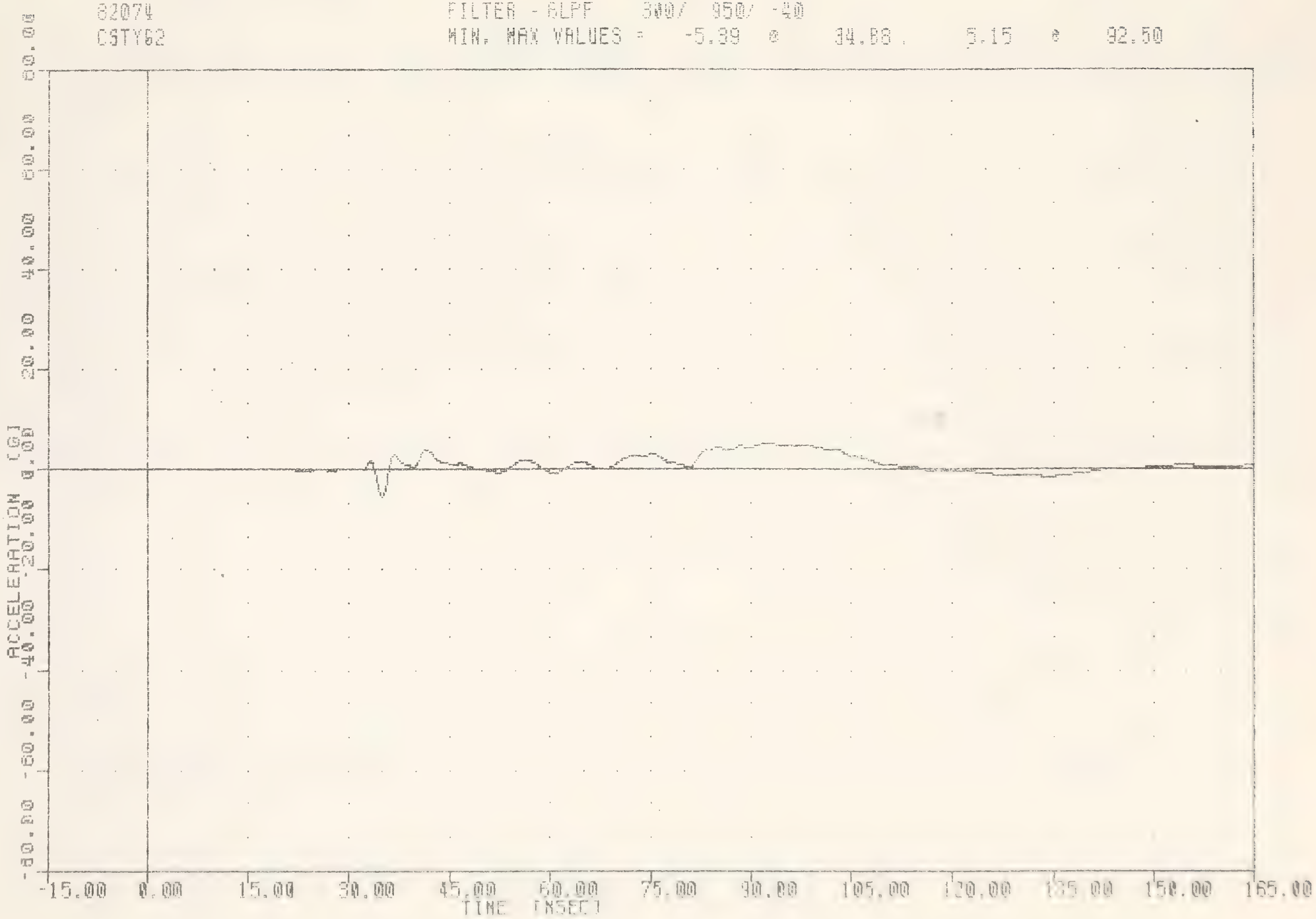
HEAD ACCELERATION Z AXIS PASSENGER



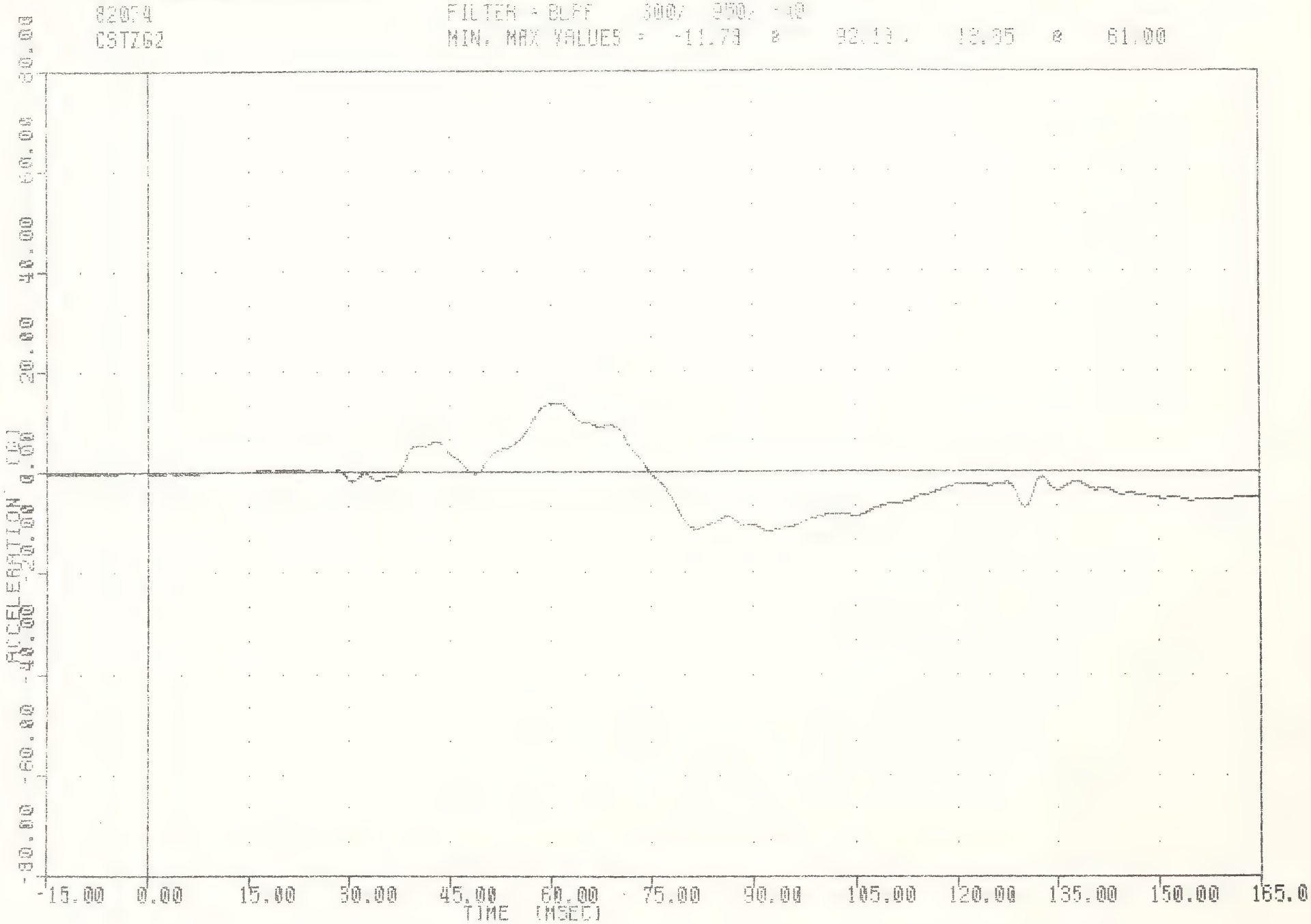
HEAD ACCELERATION RESULTANT PASSENGER



CHEST ACCELERATION X AXIS PASSENGER

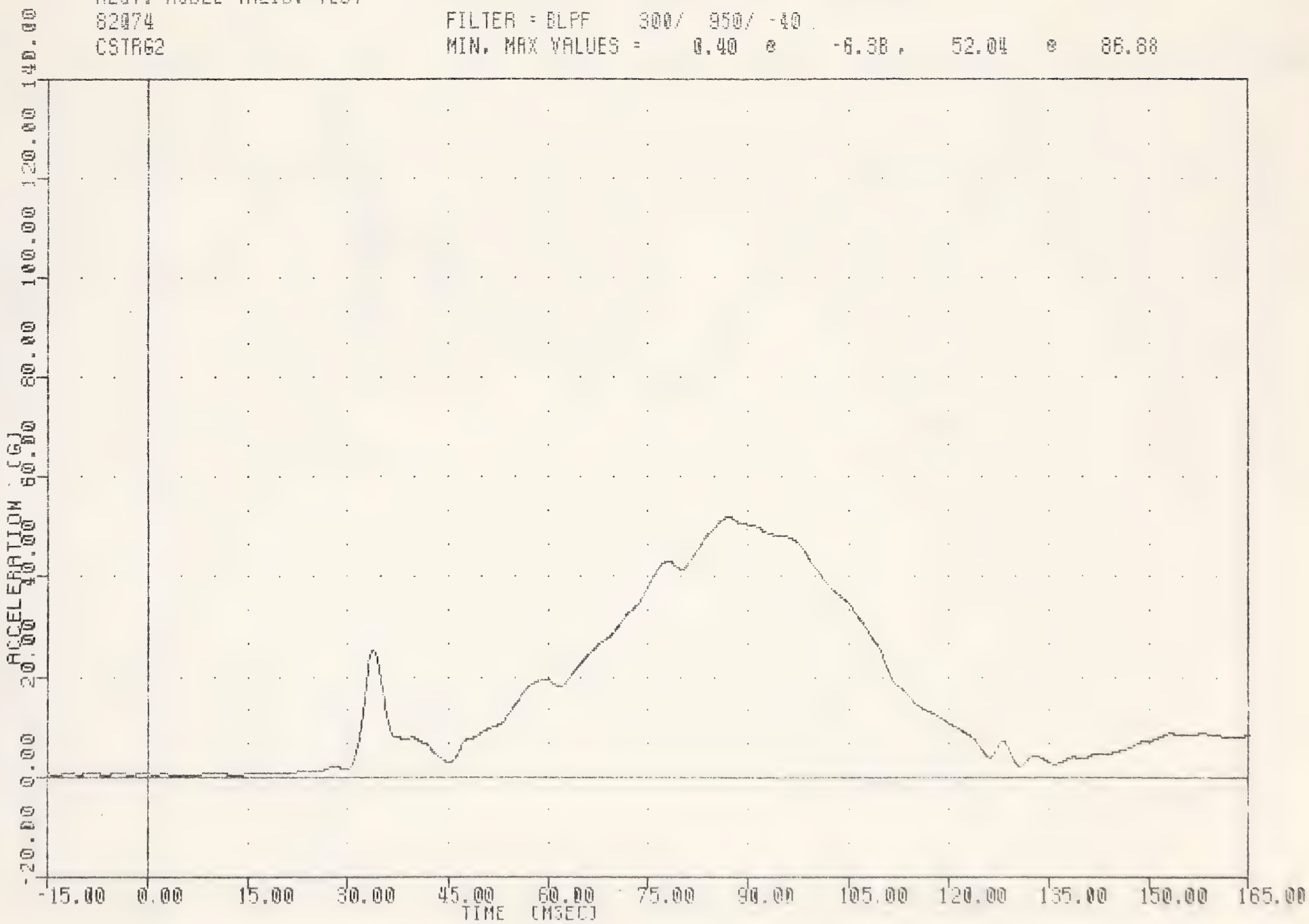


CHEST ACCELERATION Y AXIS PASSENGER

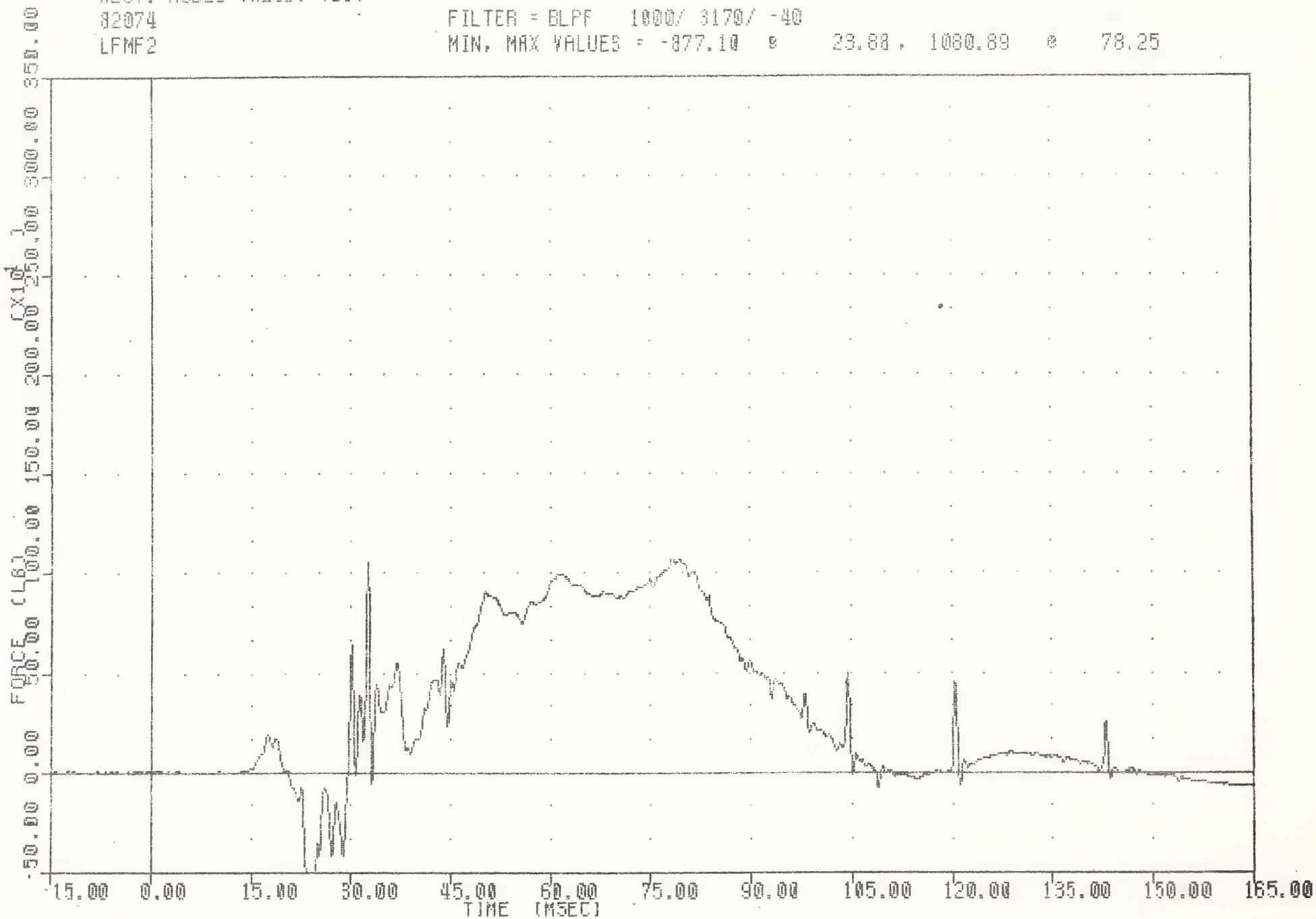


CHEST ACCELERATION Z AXIS PASSENGER

S51075050 , TRC062 31-MAR-82 13:10:10
REST. MODEL VALID. TEST
82074 FILTER = BLPF 300/ 950/ -40
CSTR62 MIN, MAX VALUES = 0.40 @ -6.38 , 52.04 @ 86.88

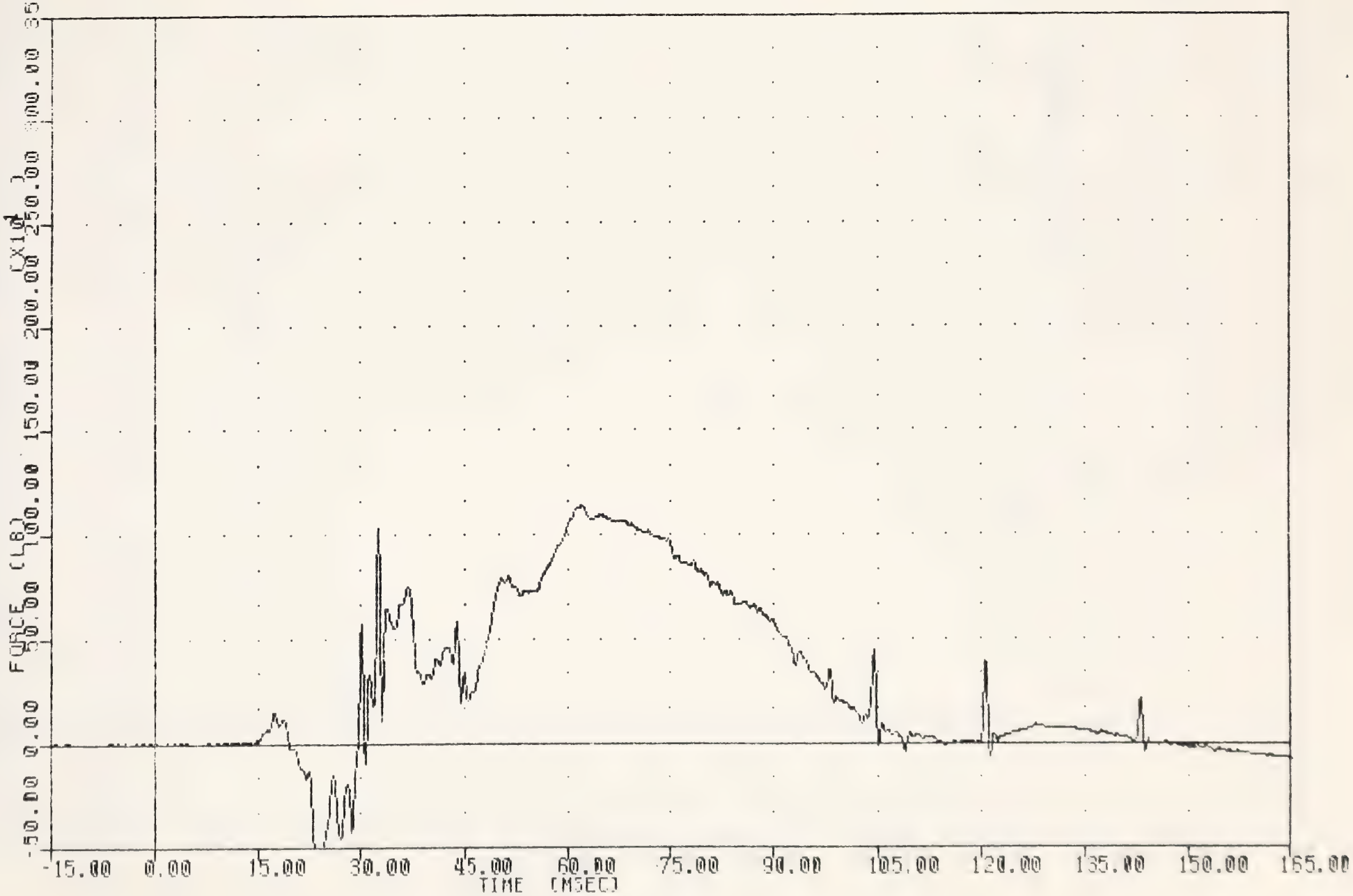


CHEST ACCELERATION RESULTANT PASSENGER

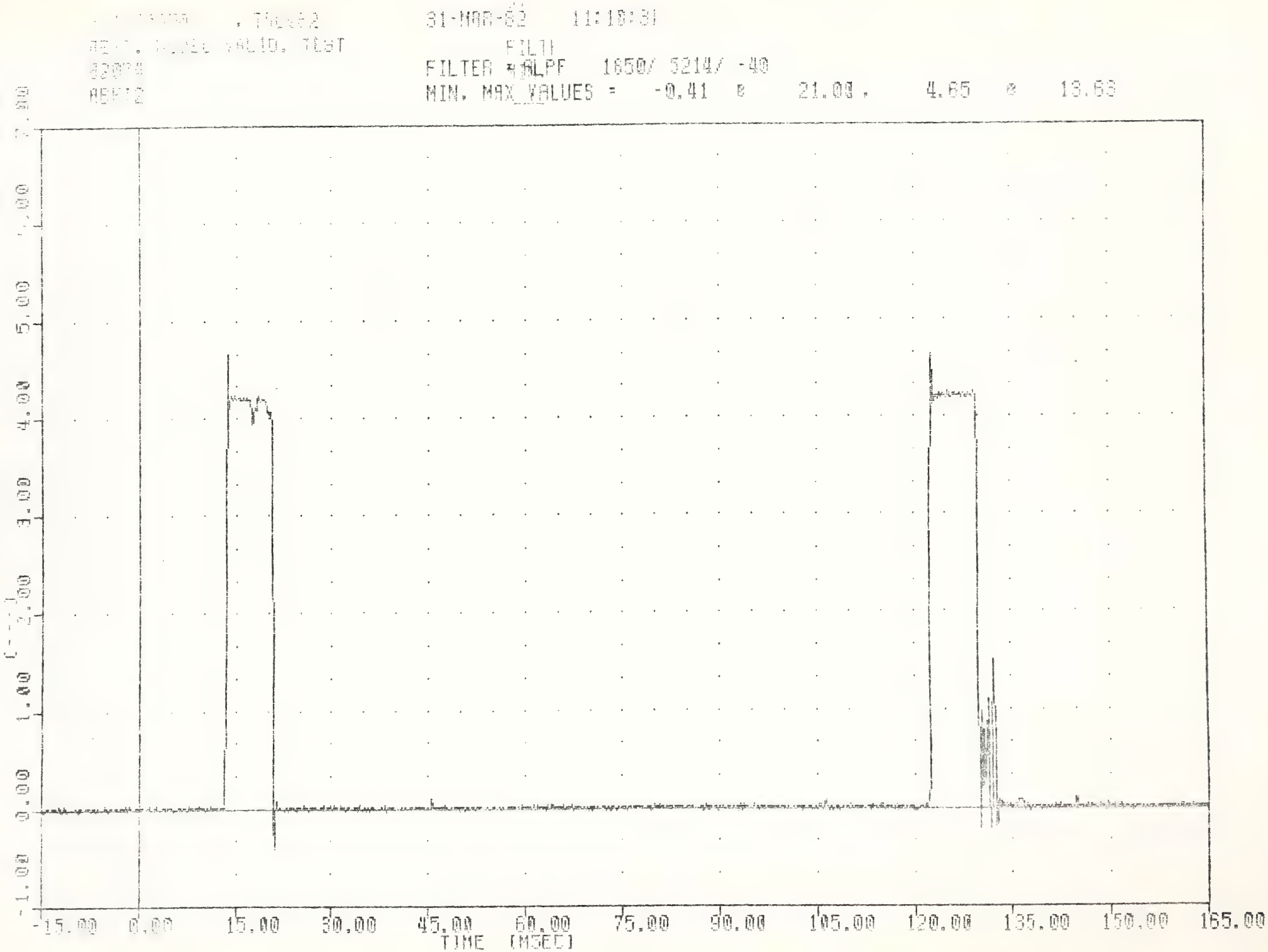


LEFT FEMUR FORCE PASSENGER

S51075050 , TRC062 31-MAR-82 13:10:10
REST. MODEL VALID. TEST
82074 FILTER = BLPF 1000/ 3170/ -40
RFNF2 MIN. MAX VALUES = -734.29 @ 23.75 , 1142.82 @ 62.00

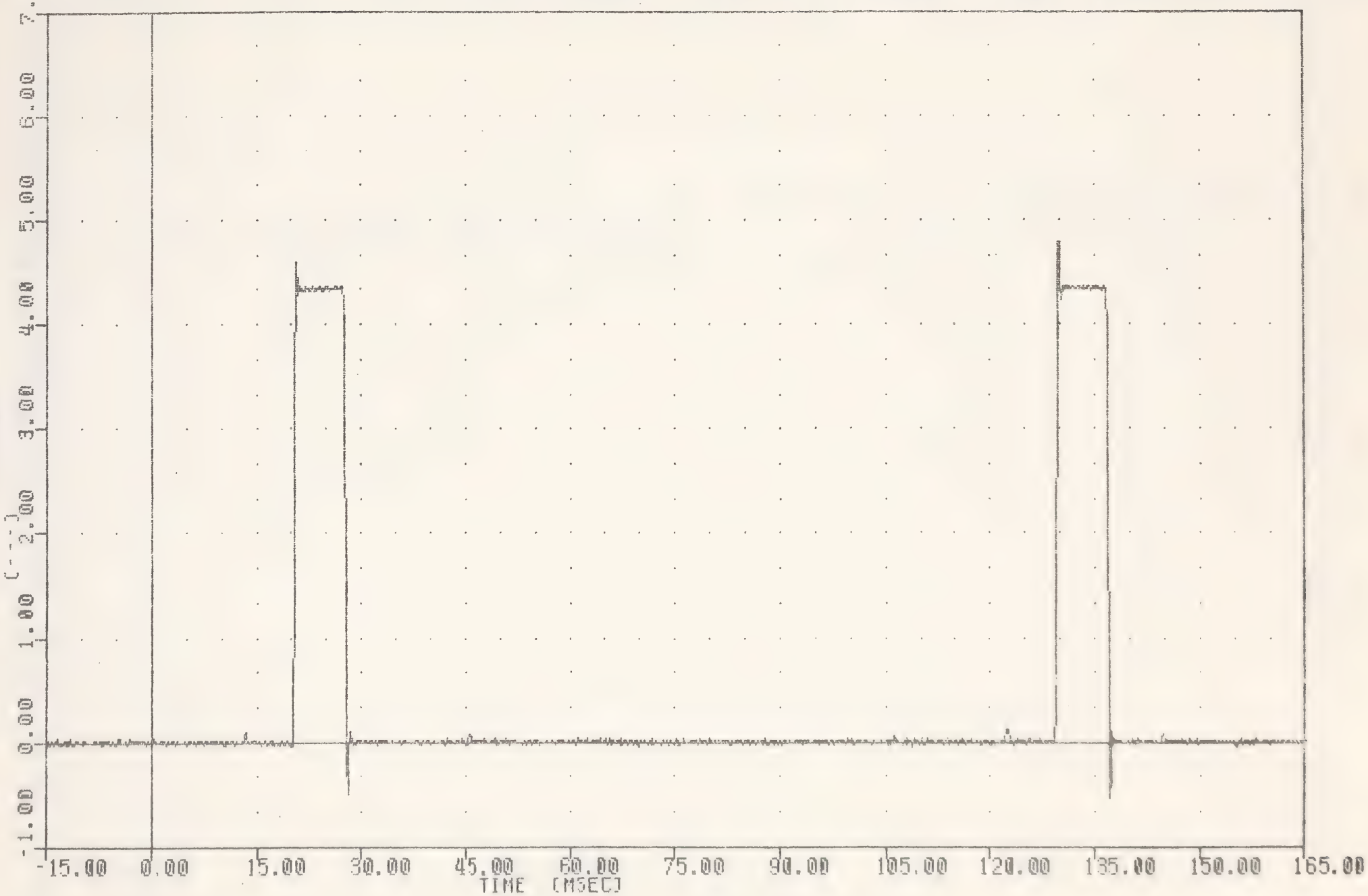


RIGHT FEMUR FORCE PASSENGER

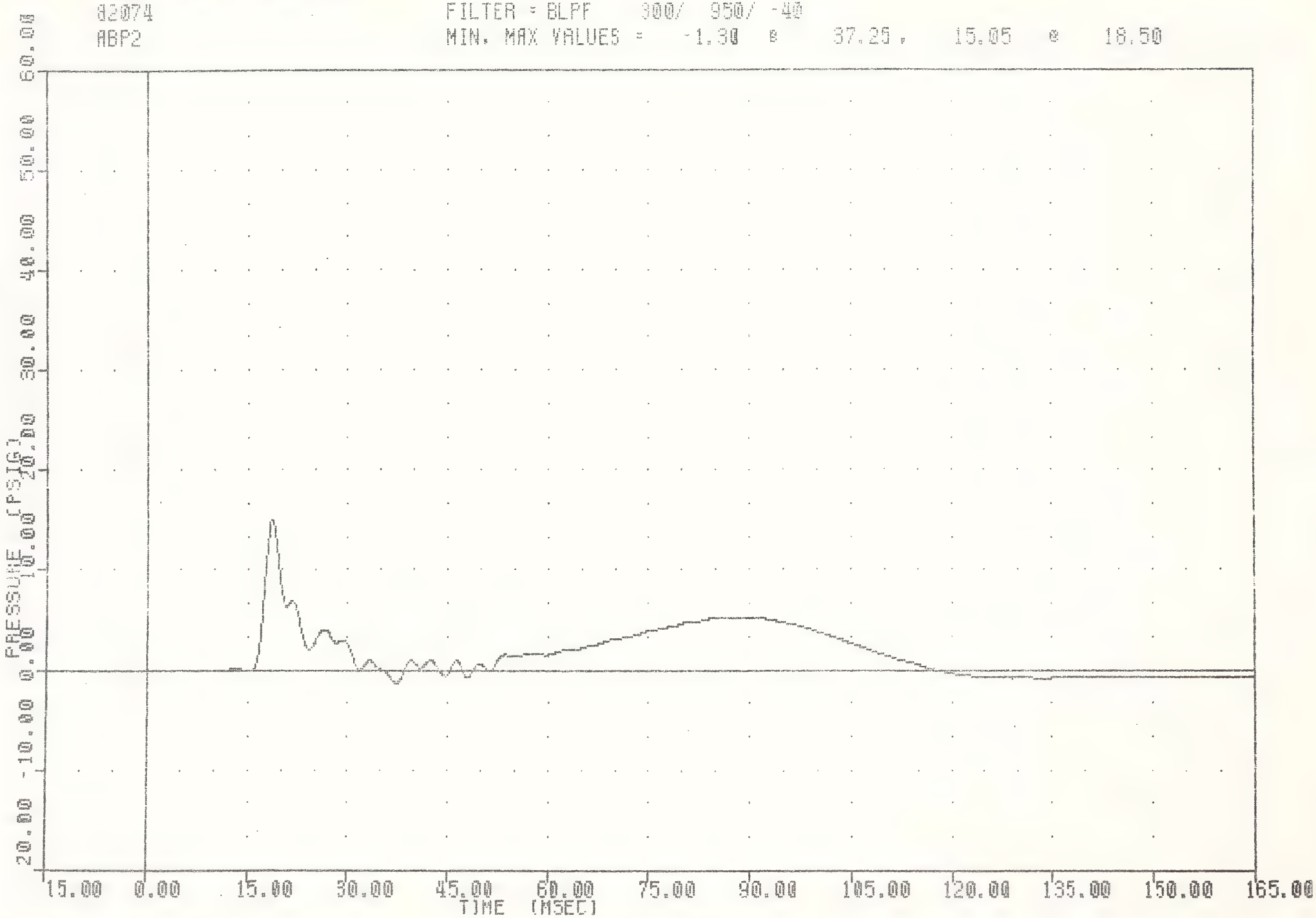


AIR BAG FIRING EVENT PASSENGER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = ALPF 1650/ 5214/ -40
ABFT3 MIN. MAX VALUES = -0.53 @ 137.00 , 4.79 @ 129.75

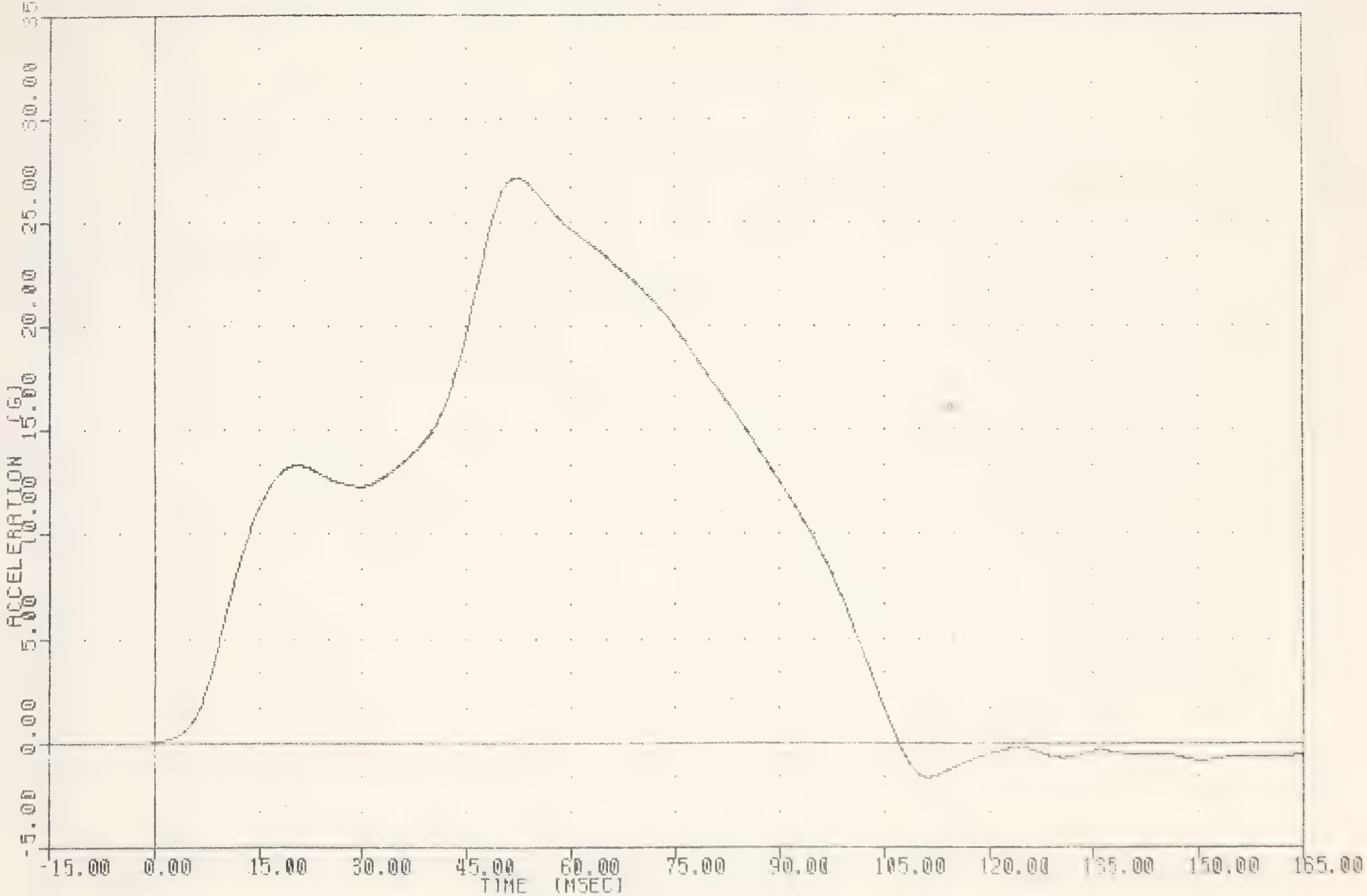


AIR BAG FIRING EVENT 3

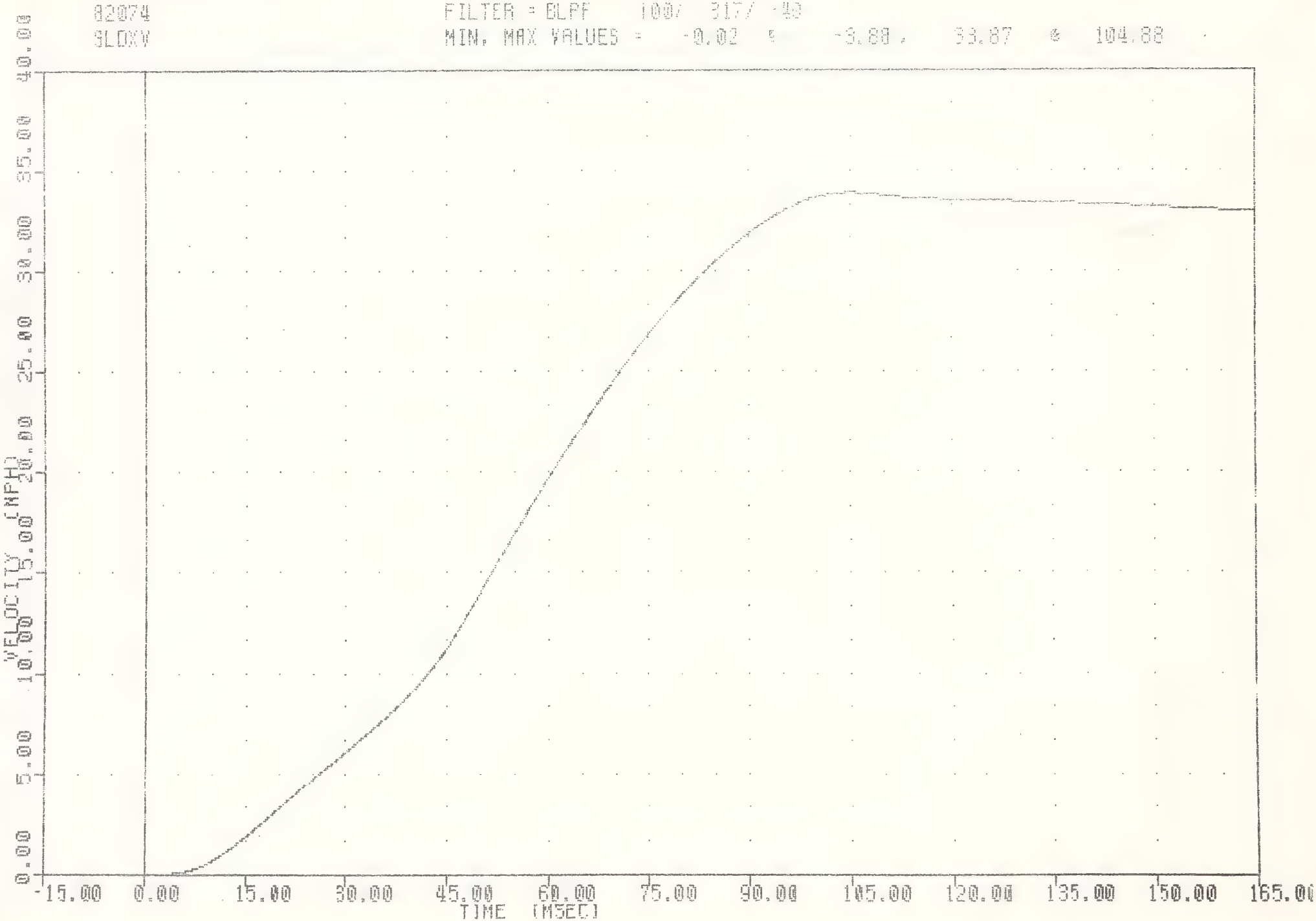


AIR BAG PRESSURE PASSENGER

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = BLPF 100/ 317/ -40
SLDXG MIN. MAX VALUES = -1.69 @ 111.13 , 27.13 @ 52.13

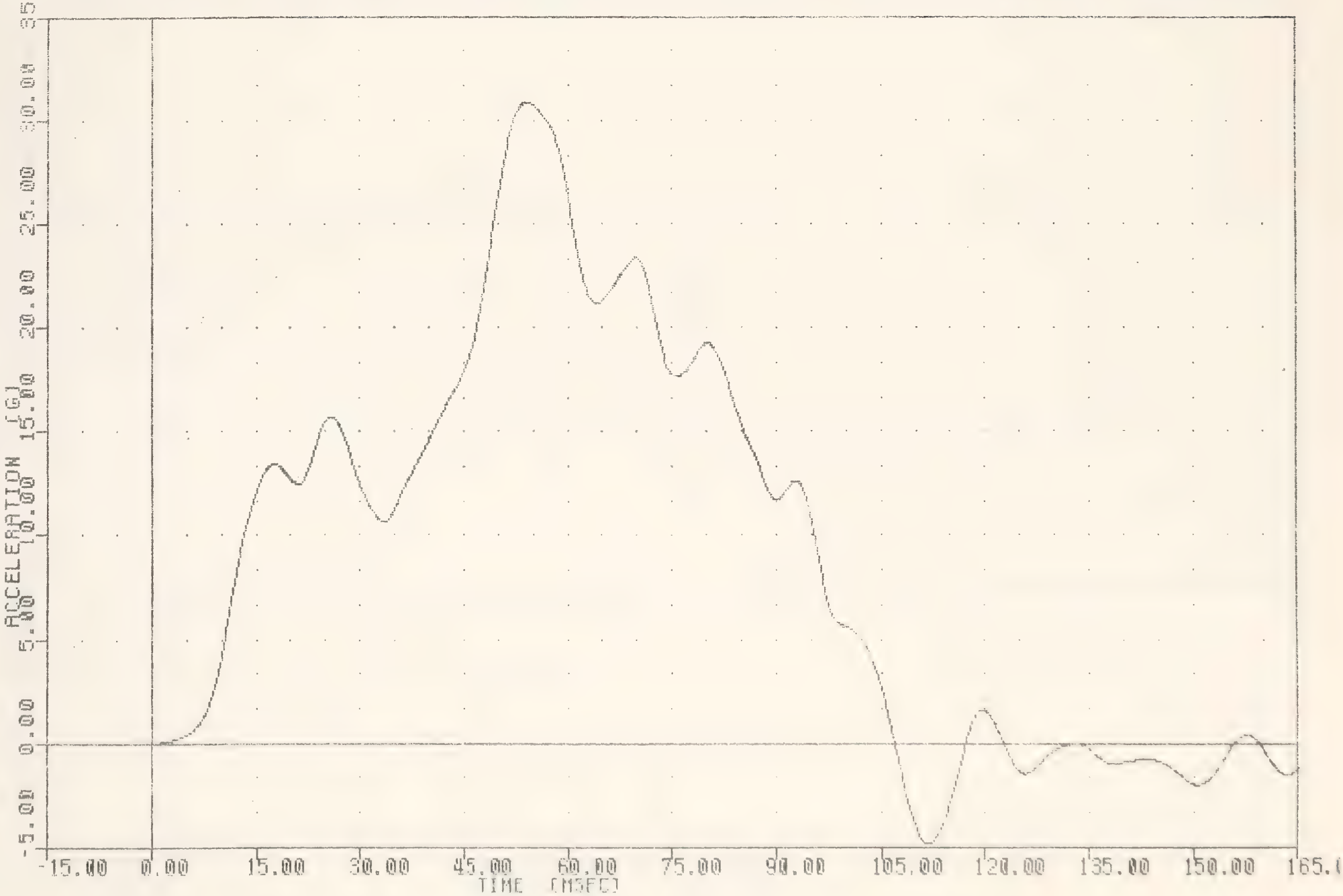


SLED ACCELERATION



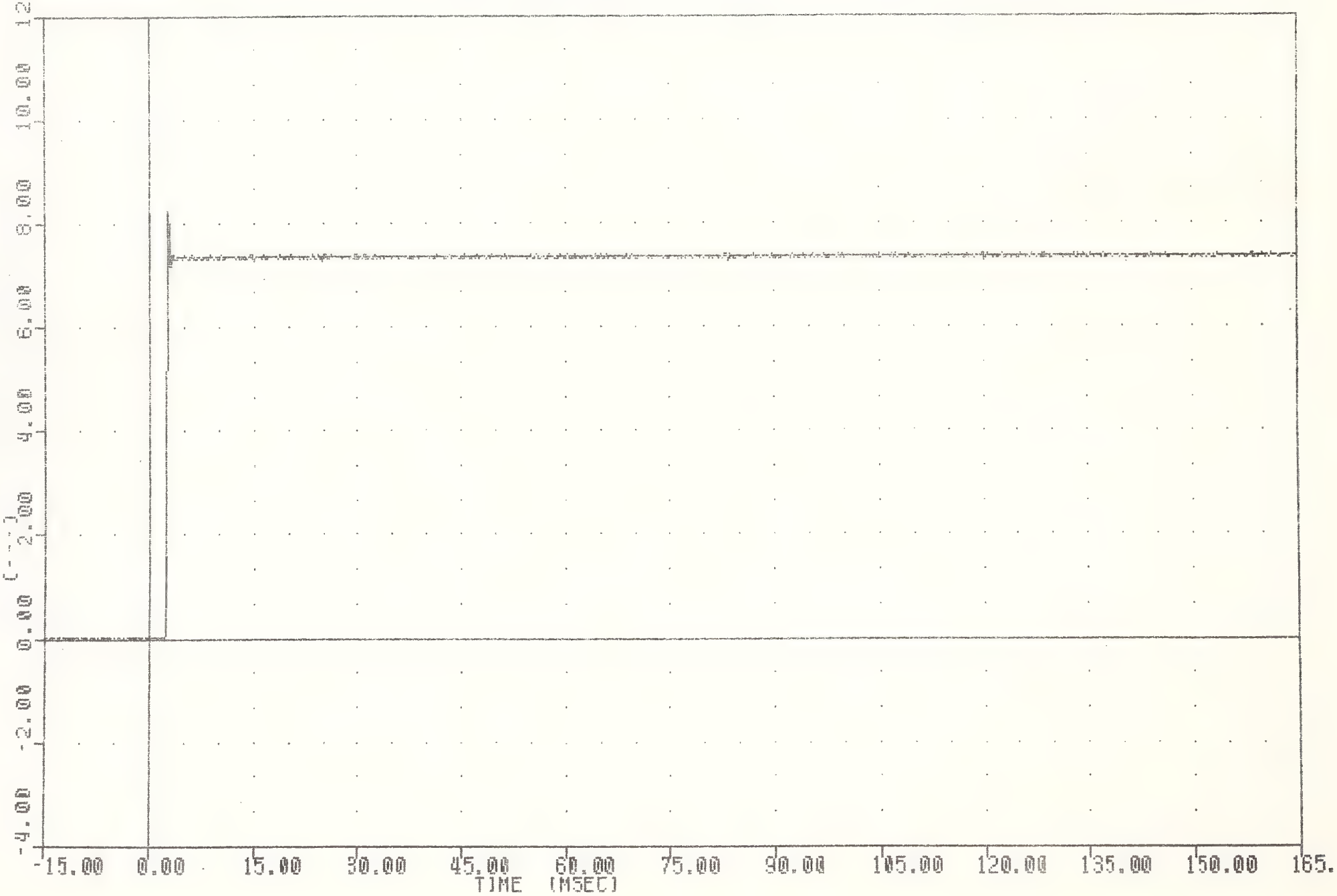
SLED VELOCITY IN MPH

S51075050 , TRC062 31-MAR-82 11:10:31
REST. MODEL VALID. TEST
82074 FILTER = BLPF 100/ 317/ -40
FTUXG MIN. MAX VALUES = -4.85 @ 111.50 , 30.86 @ 53.88



FLOOR PAN TUNNEL ACCELERATION

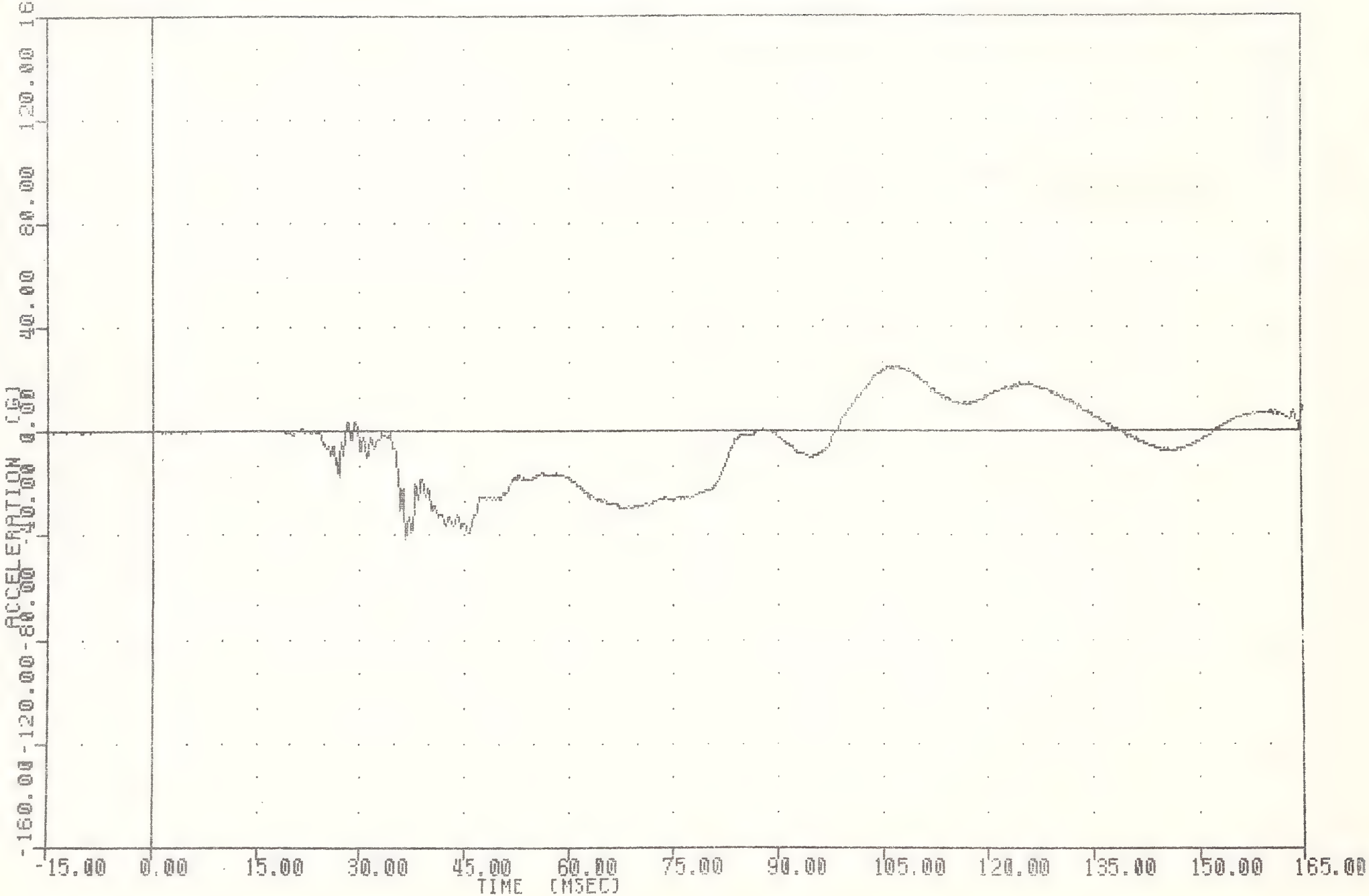
S51075050 , TRC062 S1-MAR-82 11:10:51
AEST. MODEL VALID. TEST
82074 FILTER = ALPF 1650/ 5214/ -40
SPSW MIN, MAX VALUES = -0.03 @ -7.25 , 8.24 @ 2.63



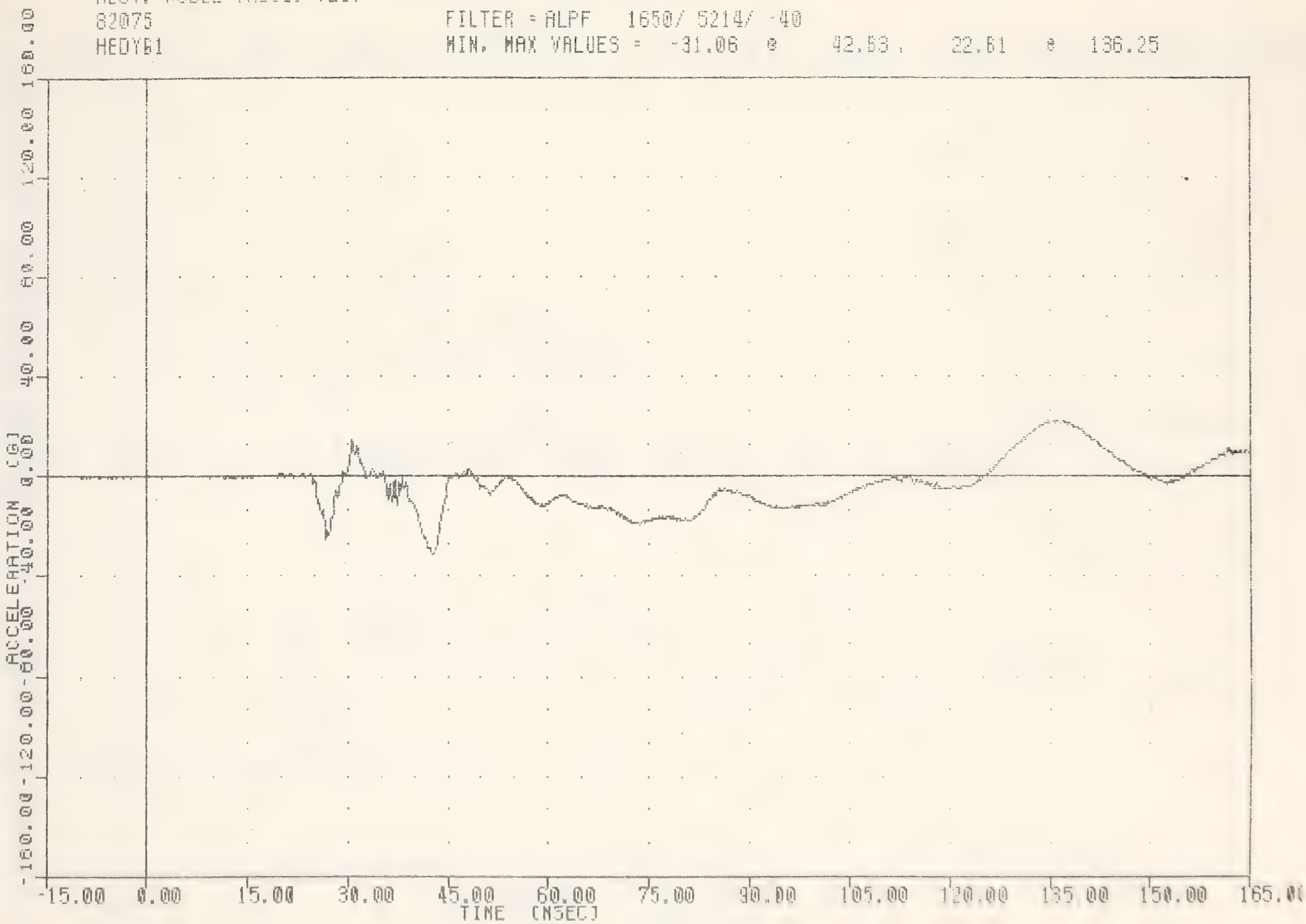
SLED POSITION SWITCH

TEST NO. 8

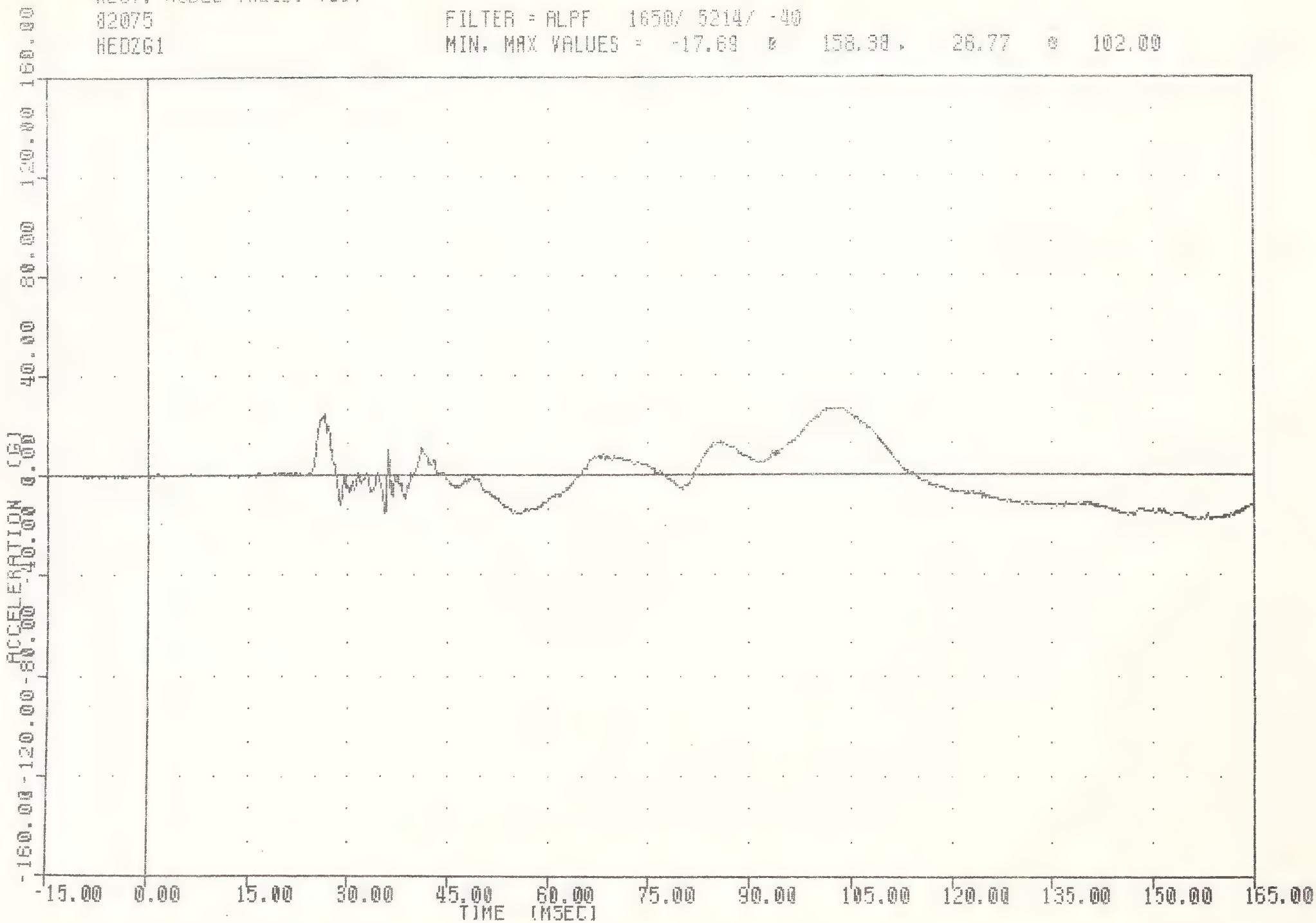
S51080505 , TRC063 1-APR-82 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = ALPF 1650/ 5214/ -40
HEOXG1 MIN. MAX VALUES = -41.36 @ 36.50 , 24.78 @ 105.88



HEAD ACCELERATION X AXIS DRIVER

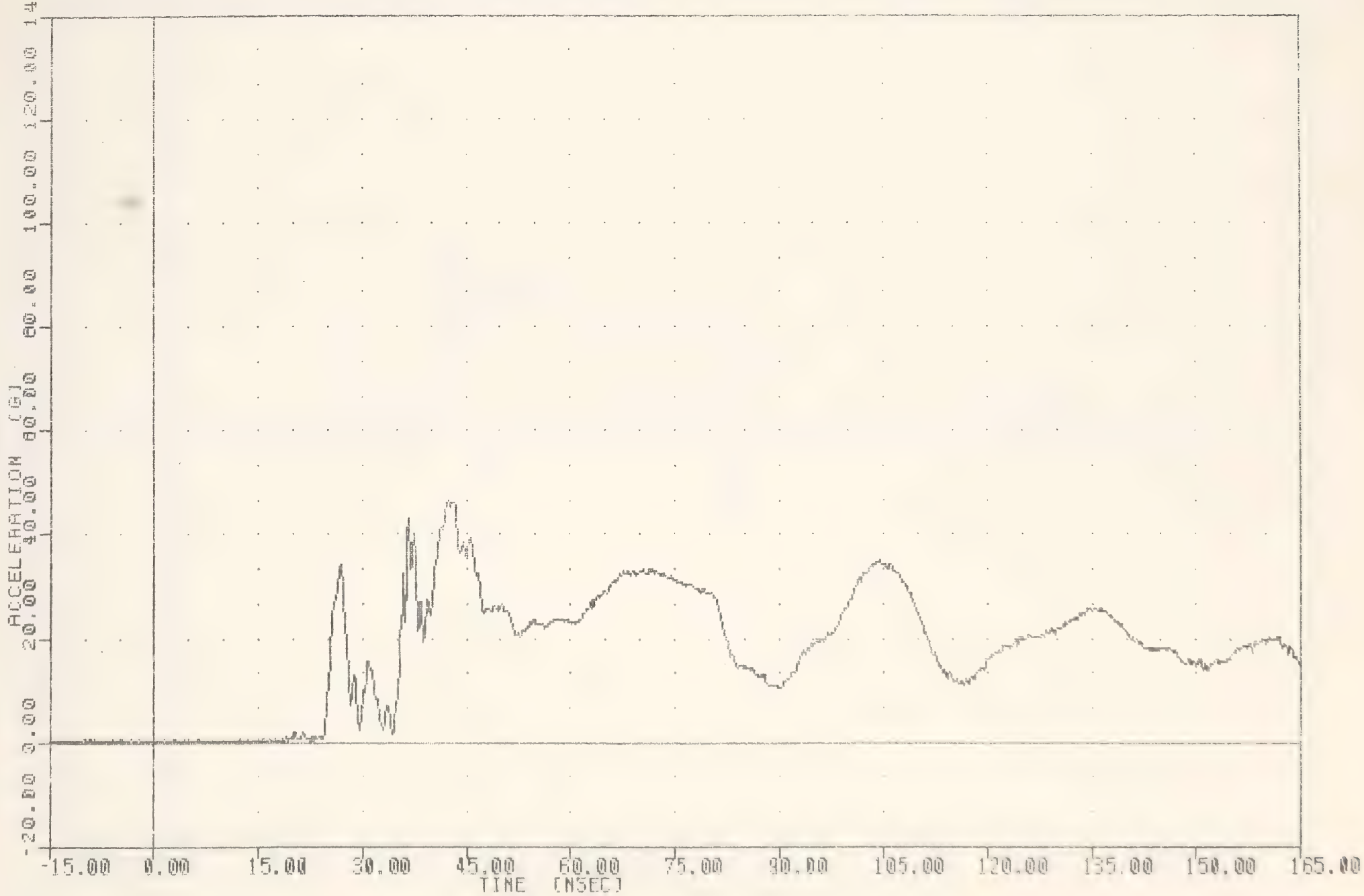


HEAD ACCELERATION Y AXIS DRIVER

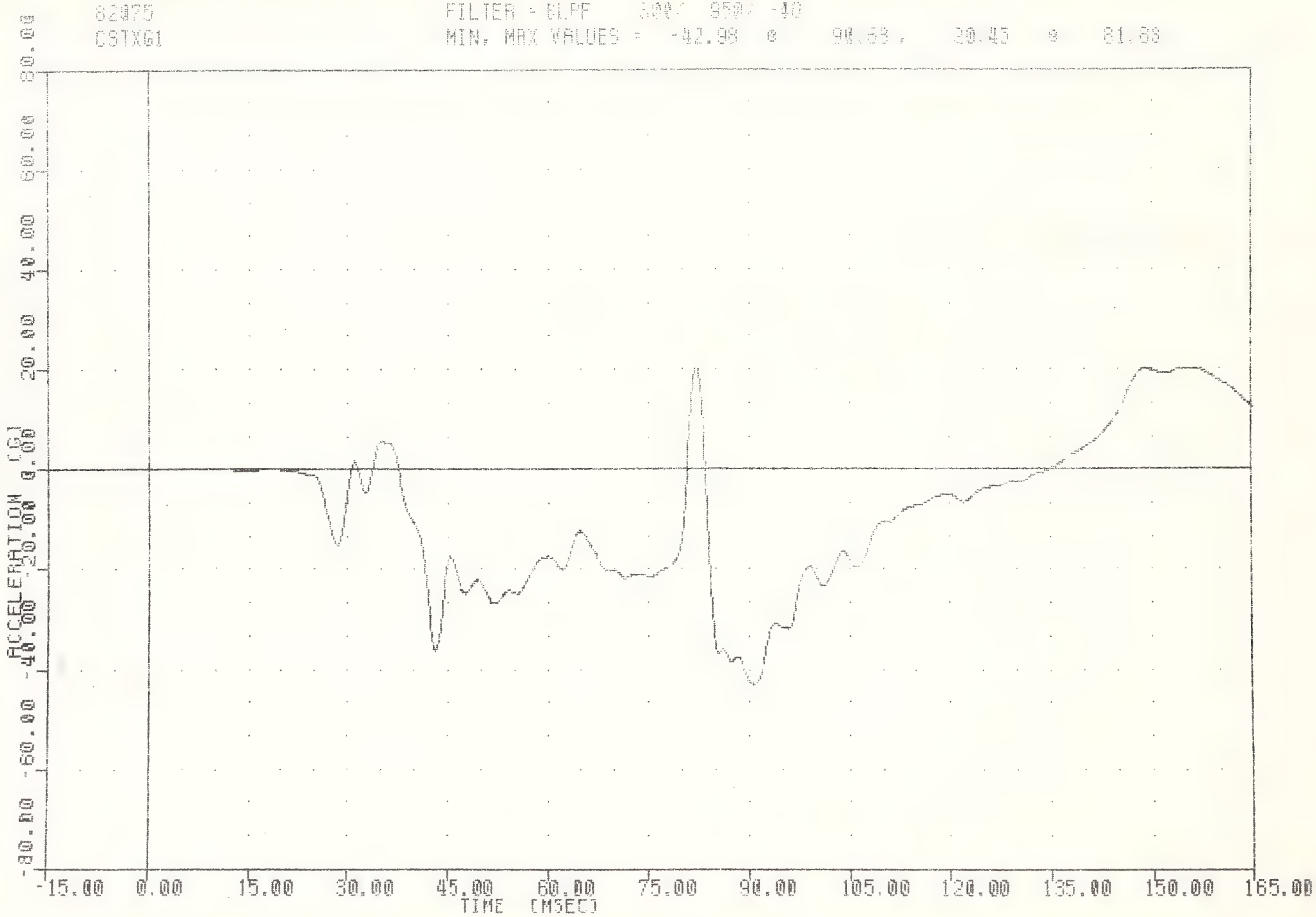


HEAD ACCELERATION Z AXIS DRIVER

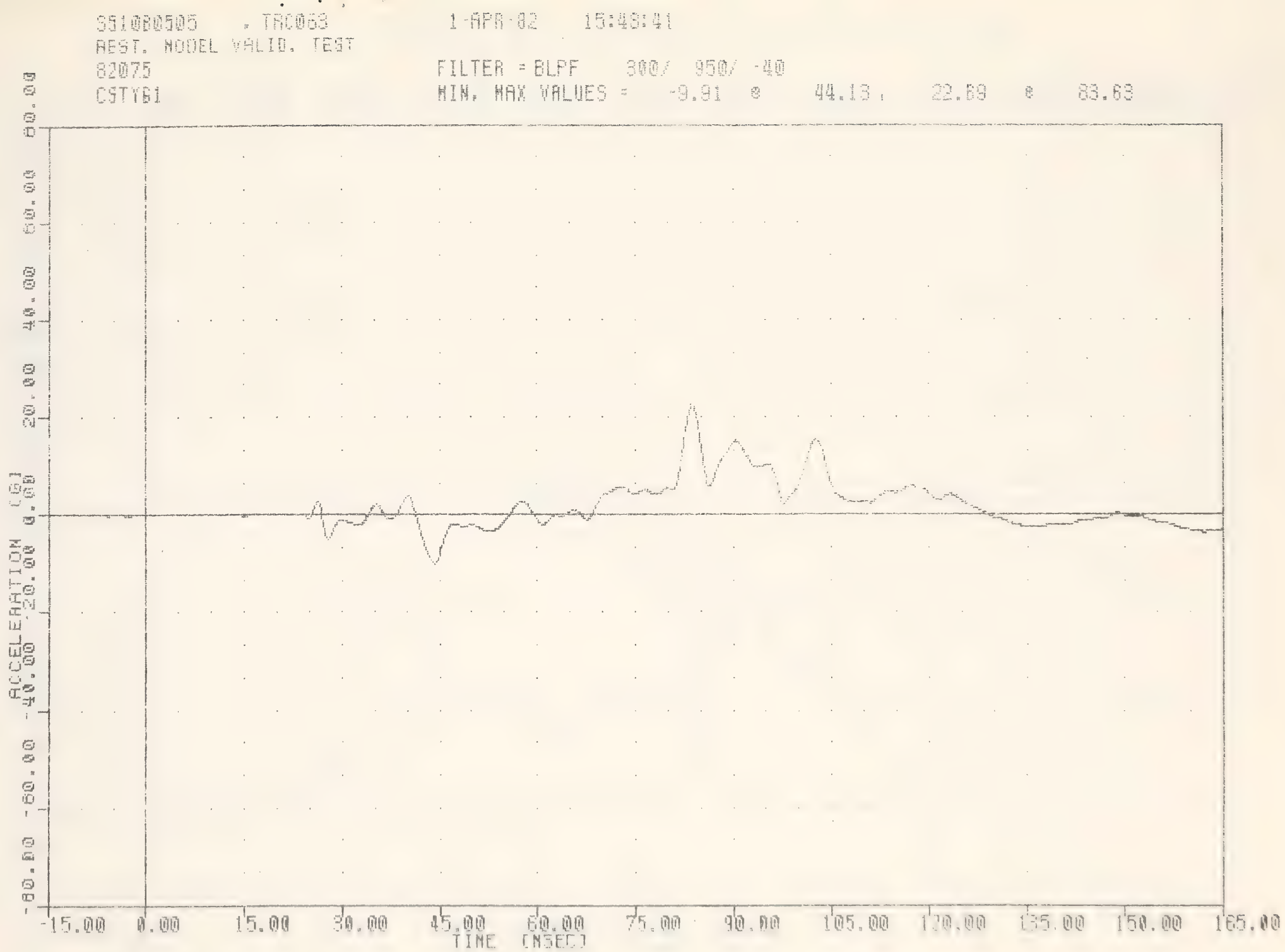
551080505 , TRC063 1-APR-82 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = ALPF 1650/ 5214/ -40
HEDR61 MIN. MAX VALUES = 0.05 @ 3.38 , 46.50 @ 42.25



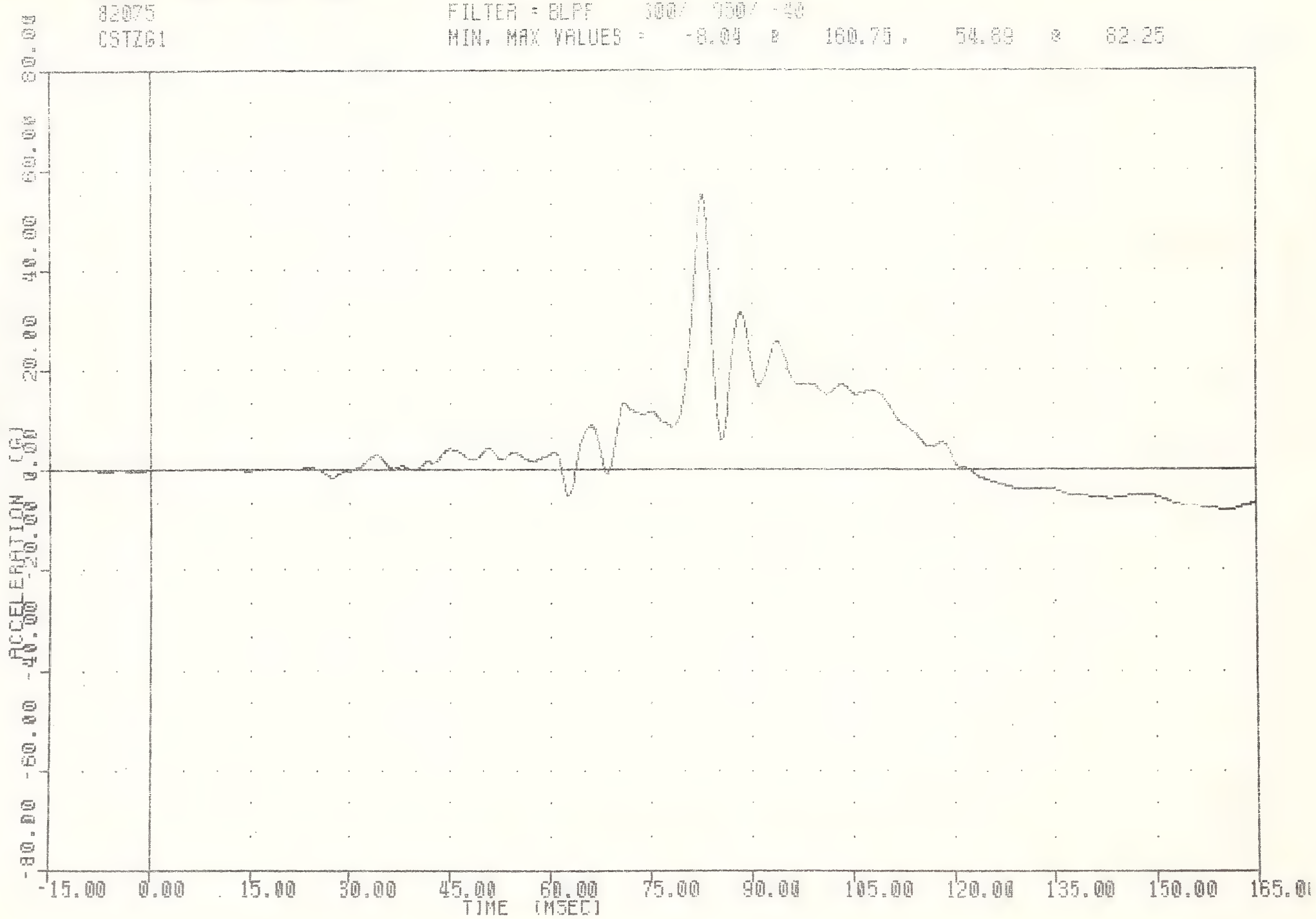
HEAD ACCELERATION RESULTANT DRIVER



CHEST ACCELERATION X AXIS DRIVER

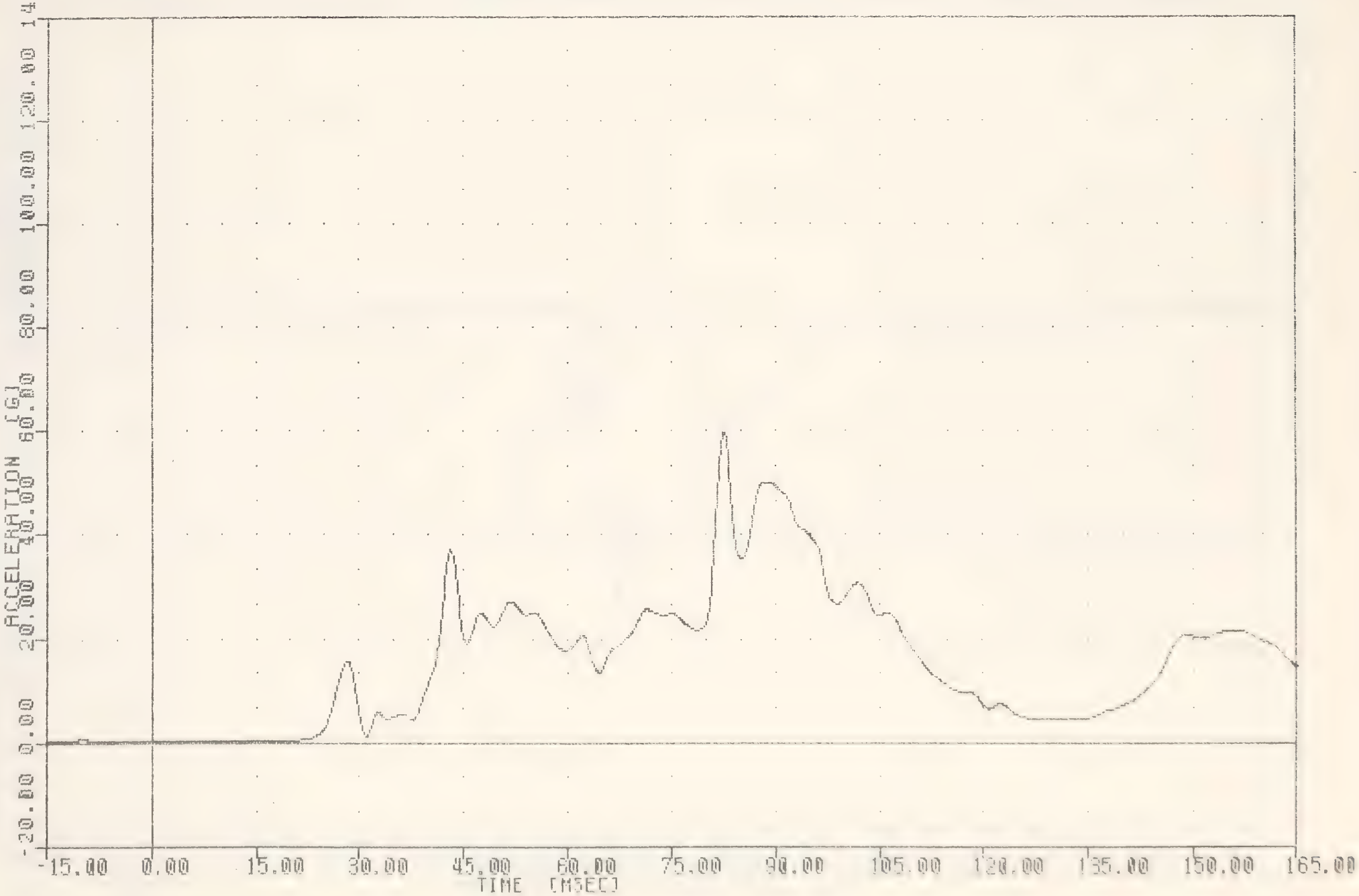


CHEST ACCELERATION Y AXIS DRIVER

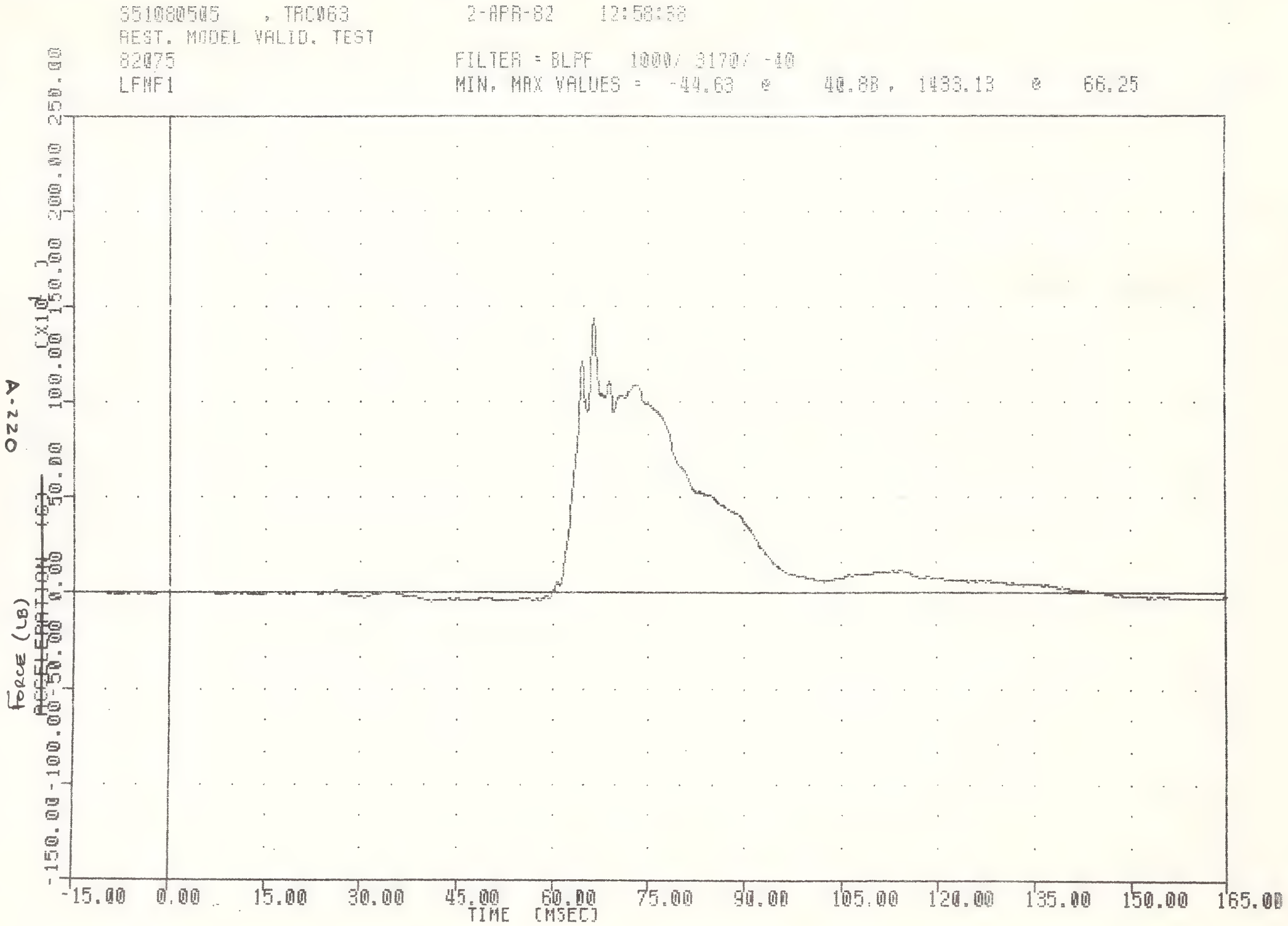


CHEST ACCELERATION Z AXIS DRIVER

S510805 05 , TRC063 1-APR-82 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = BLPF 300/ 950/ -40
CSTRG1 MIN. MAX VALUES = 0.27 @ 12.50 , 59.68 @ 82.38

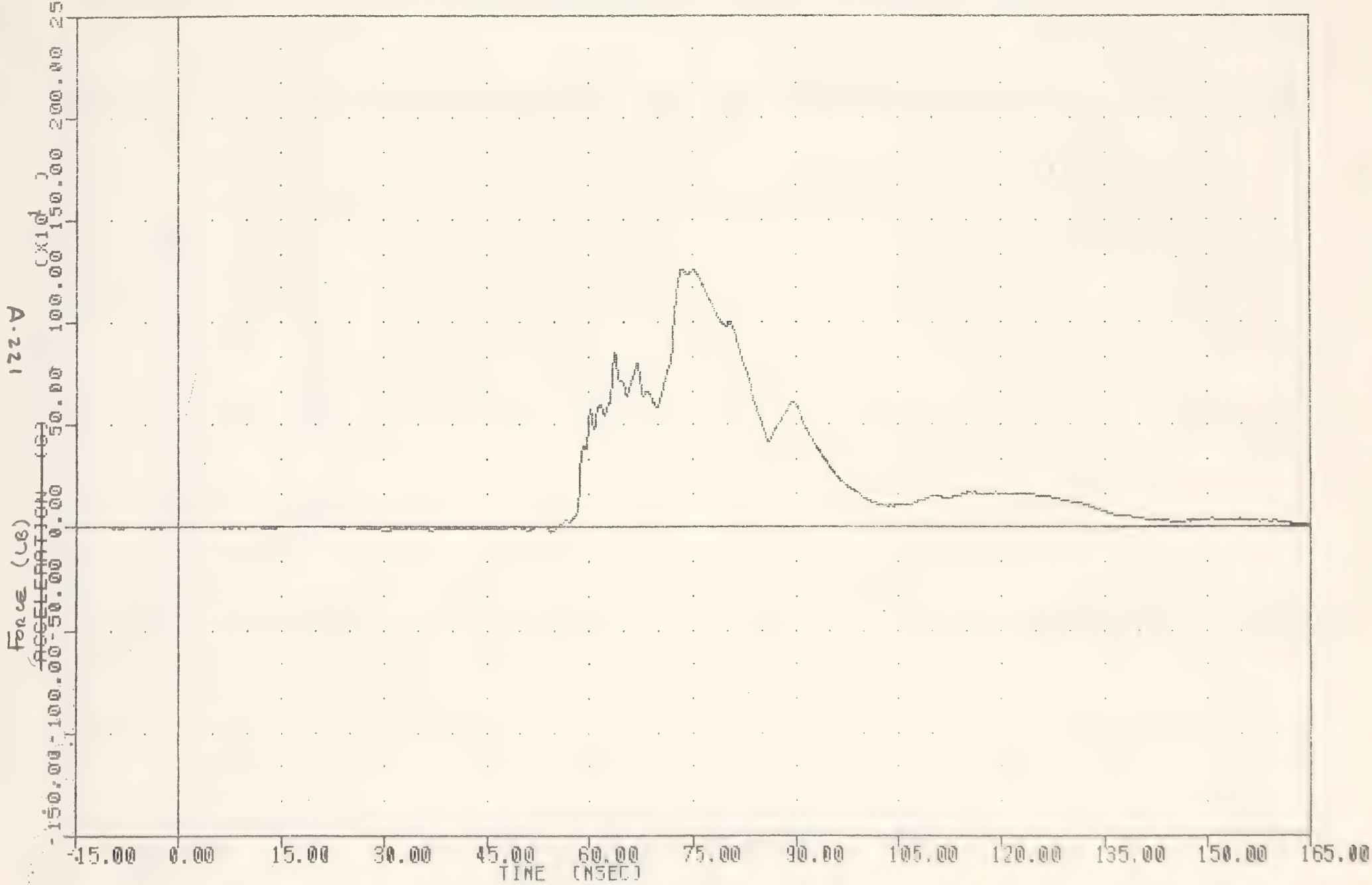


CHEST ACCELERATION RESULTANT DRIVER

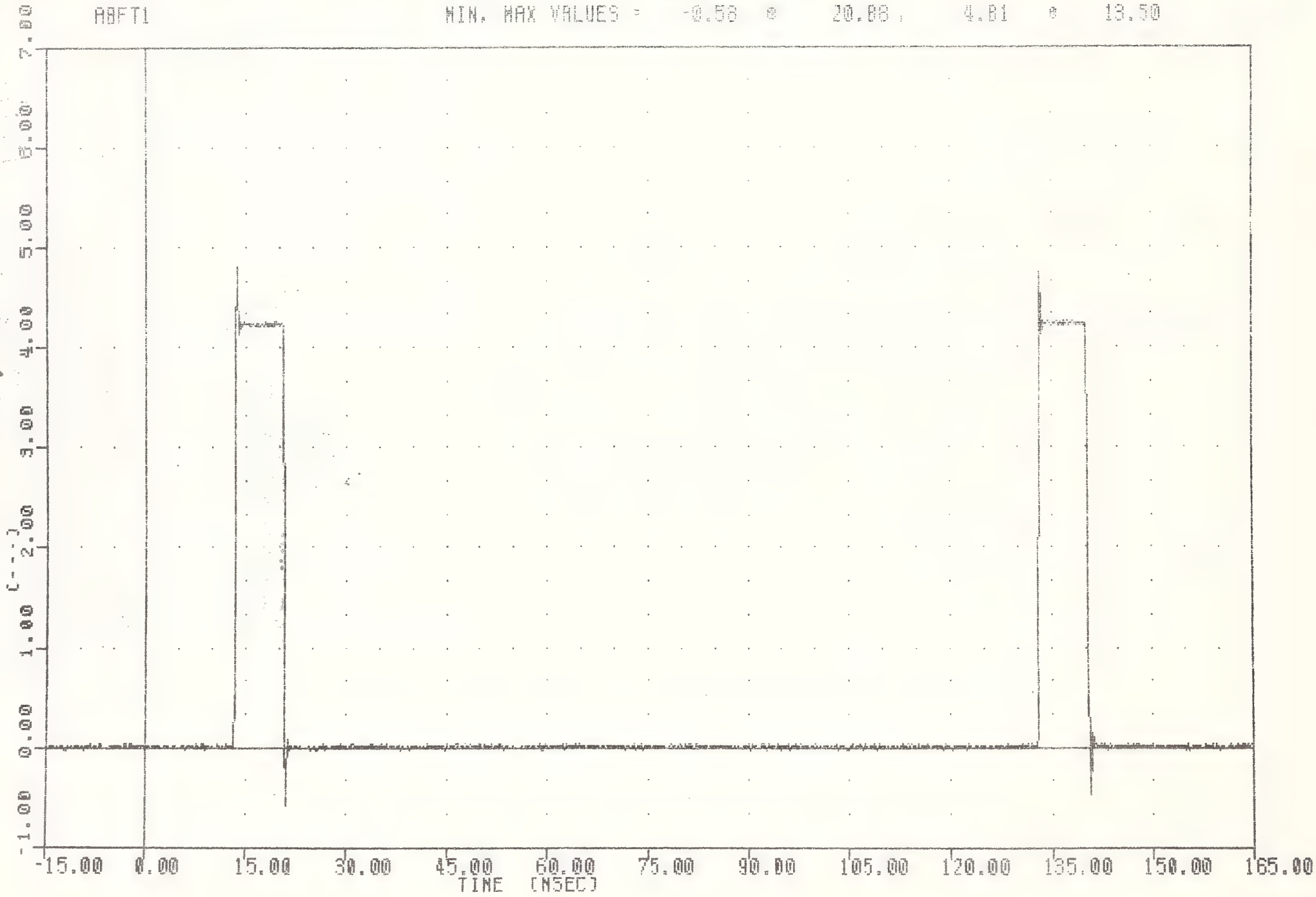


LEFT FEMUR FORCE DRIVER

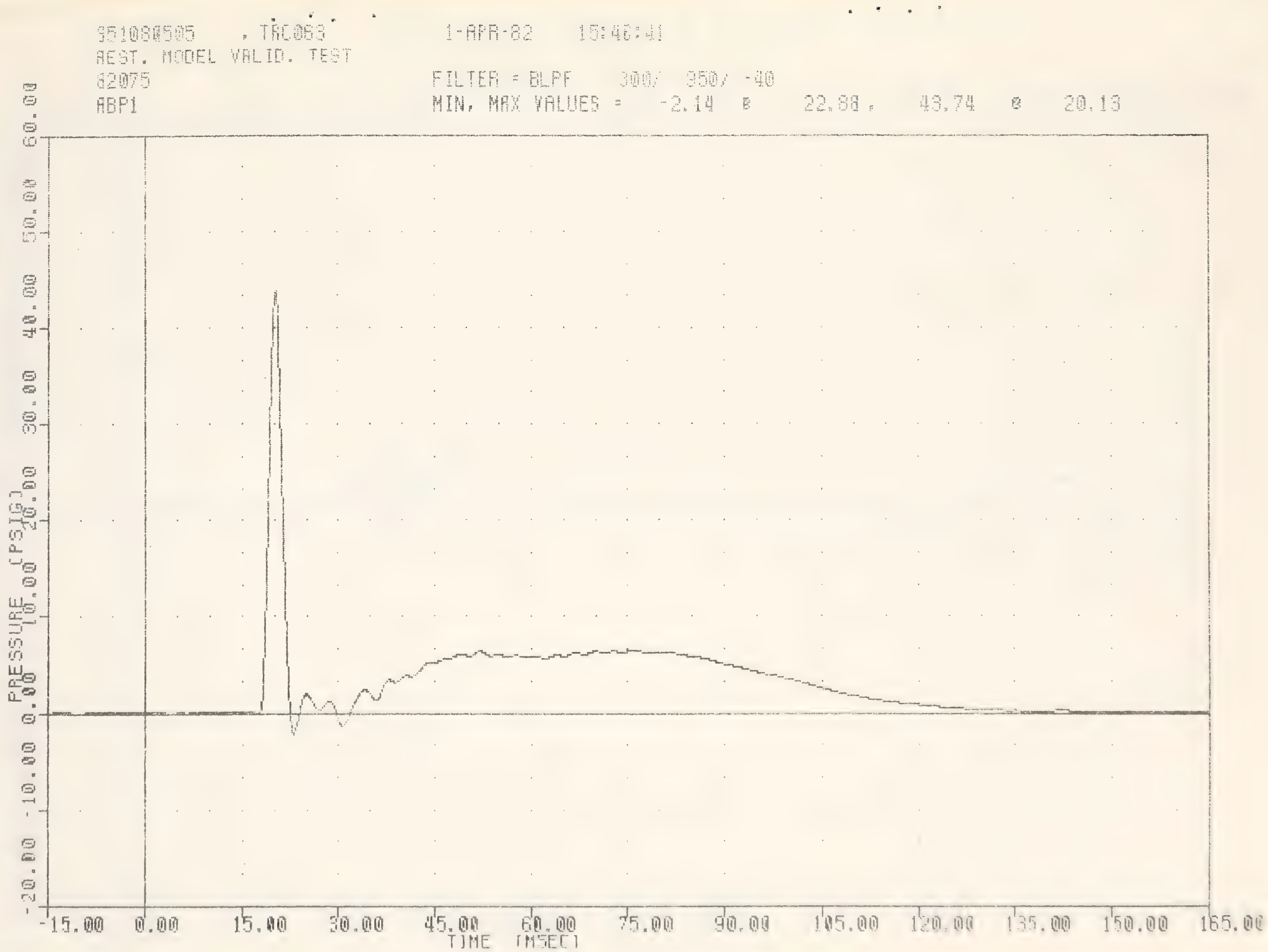
S51080505 , TRC063 2-APR-82 12:58:38
REST. MODEL VALID. TEST
82075 FILTER = BLFF 1000/ 3170/ -40
RFMF1 MIN, MAX VALUES = -22.31 @ 54.38 , 1257.75 @ 73.38



RIGHT FEMUR FORCE DRIVER

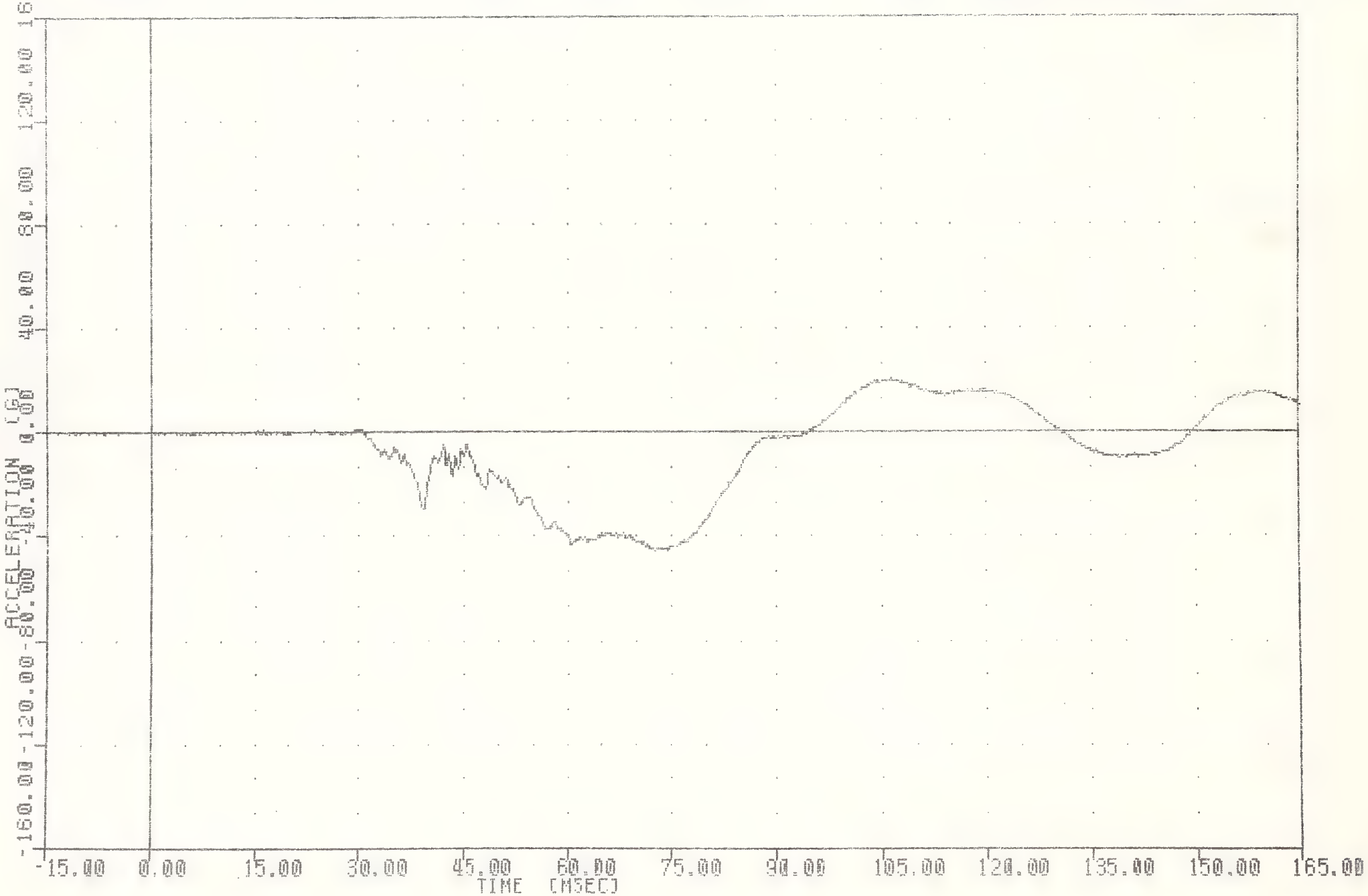


AIR BAG FIRING EVENT DRIVER

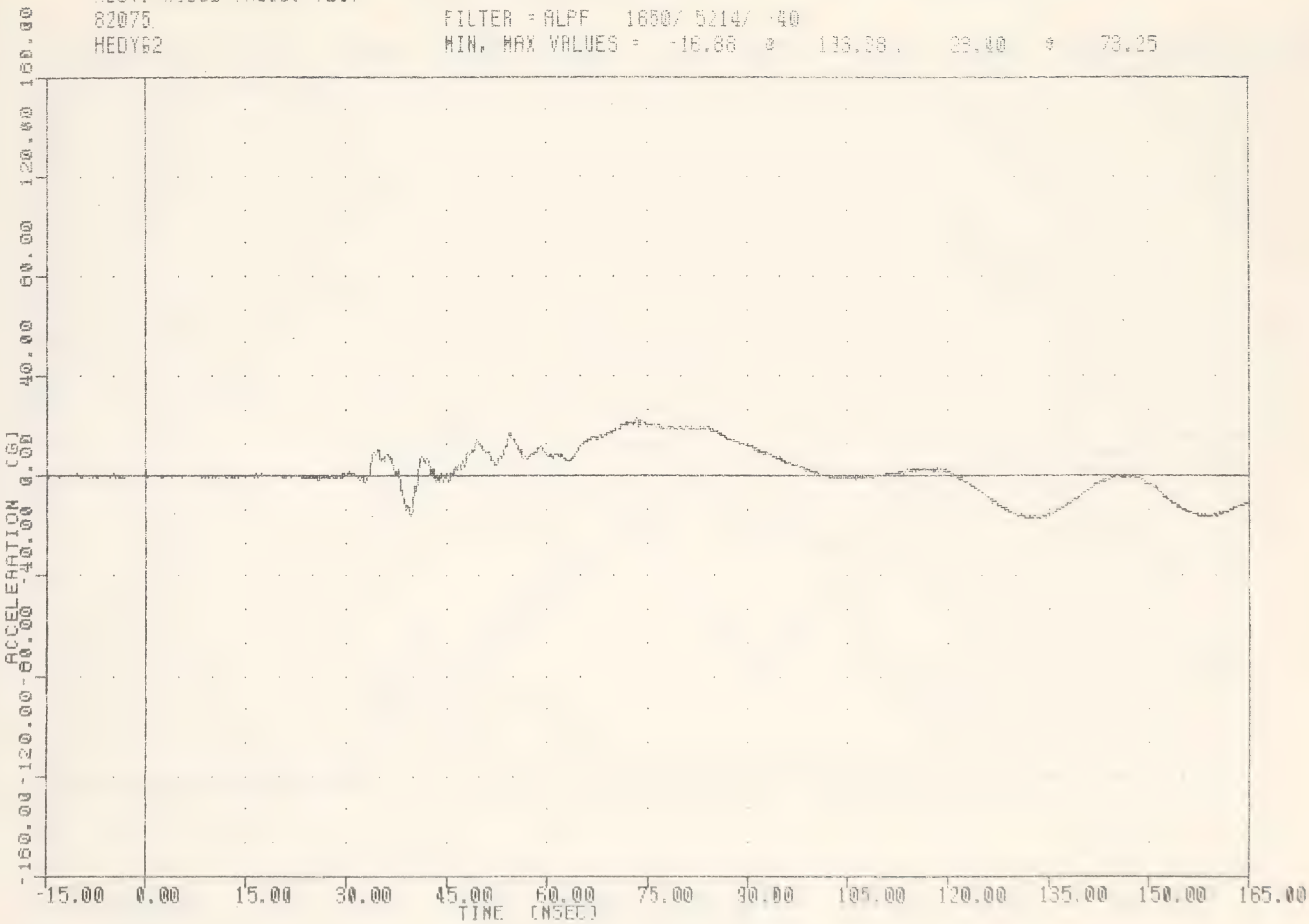


AIR BAG PRESSURE DRIVER

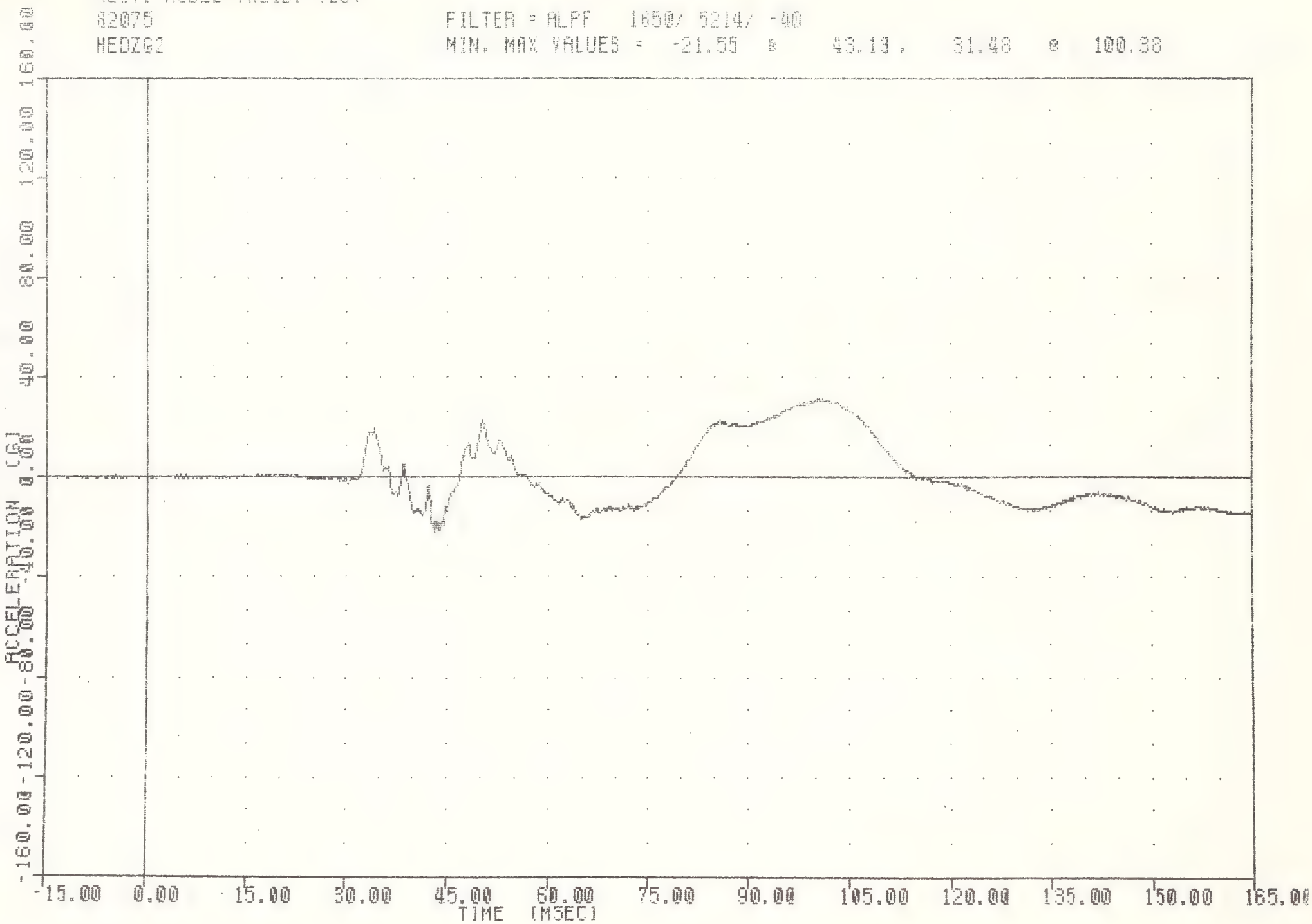
S51080505 , TRC063 1-APR-82 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = ALPF 1650/ 5214. 40
HEDXG2 MIN. MAX VALUES = -45.54 @ 72.38 . 20.38 @ 106.25



HEAD ACCELERATION X AXIS PASSENGER

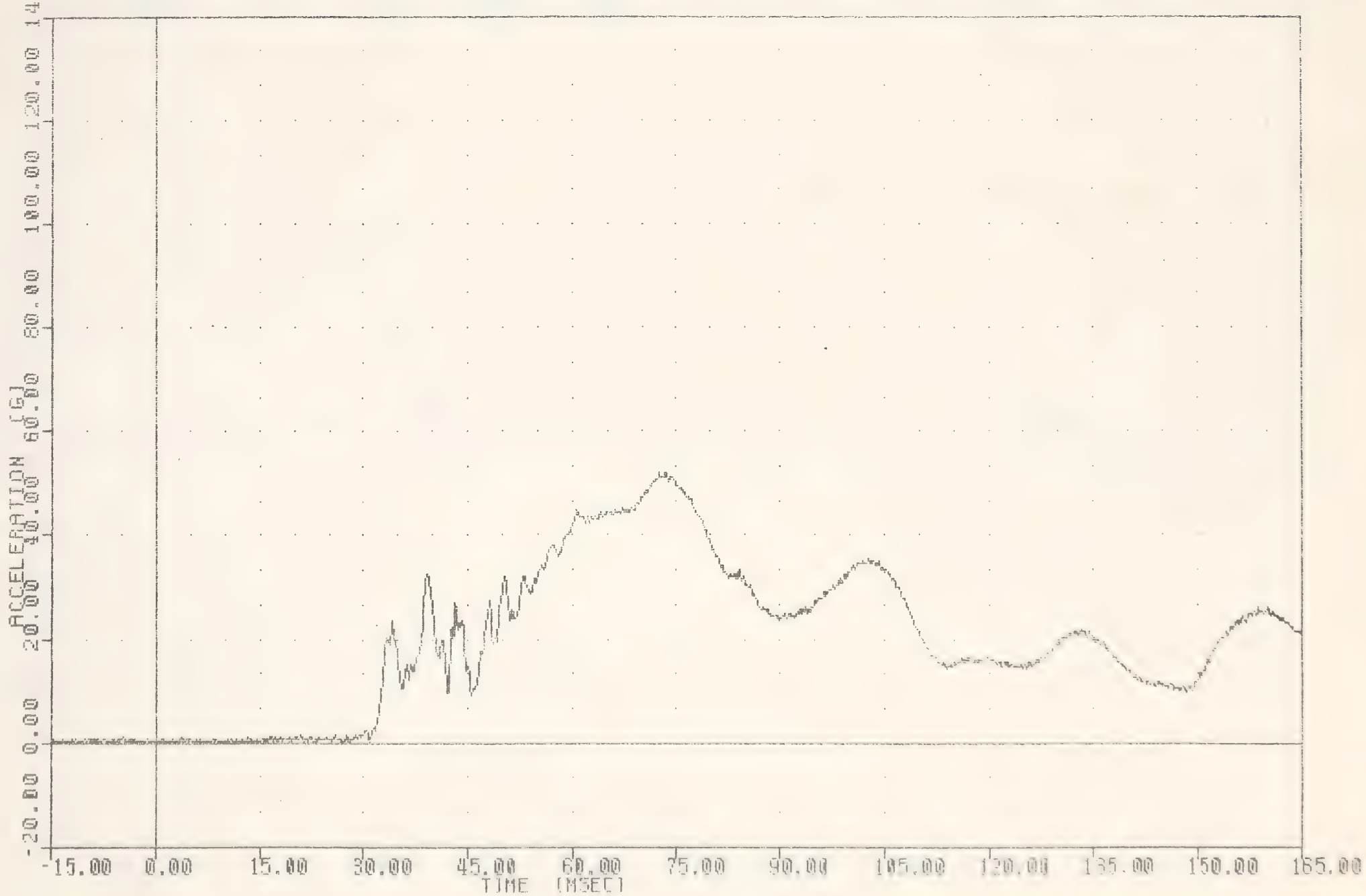


HEAD ACCELERATION Y AXIS PASSENGER

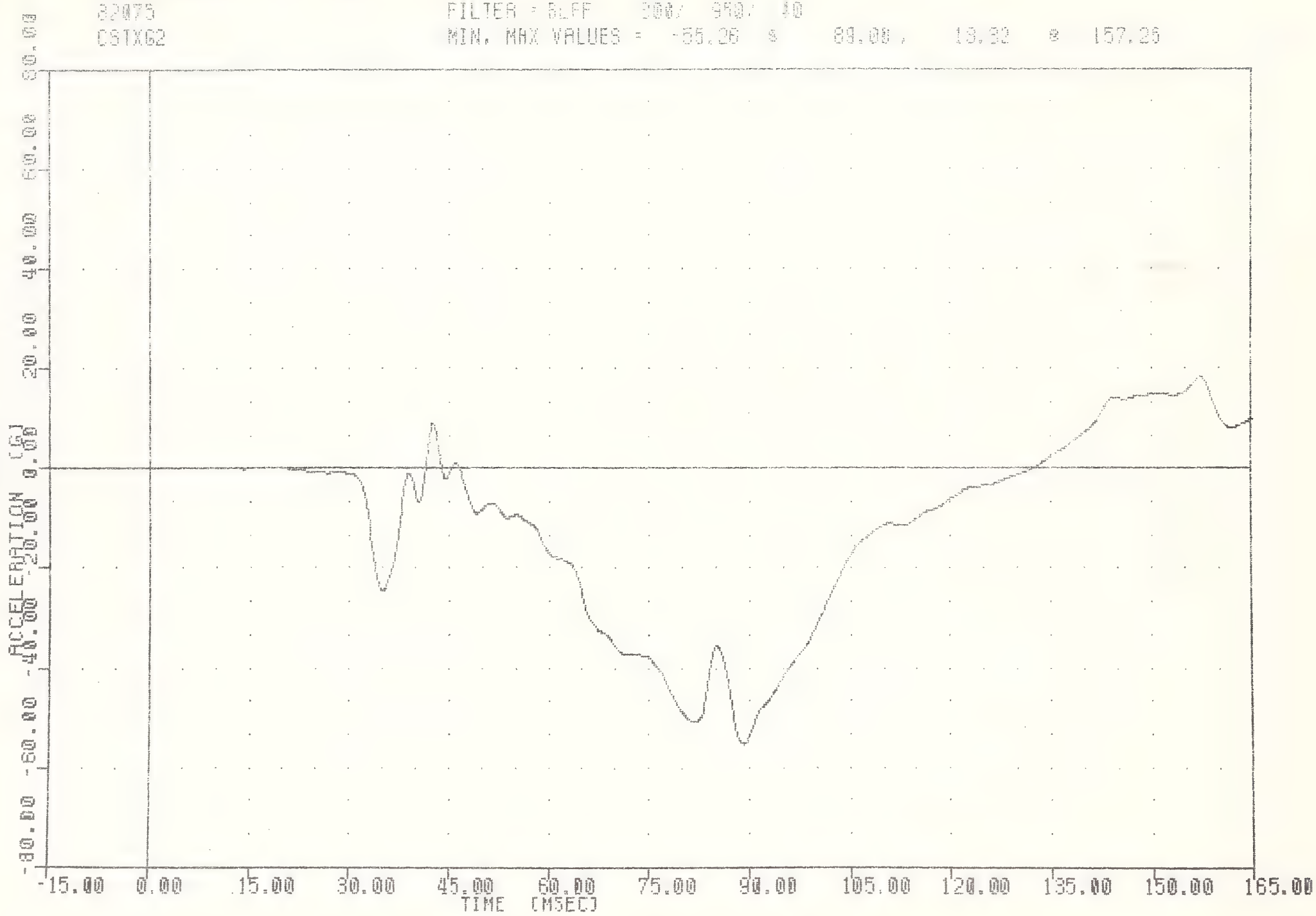


HEAD ACCELERATION Z AXIS PASSENGER

S510B0505 , TRC063 1-APR-82 15:48:41
BEST. MODEL VALID. TEST
82075 FILTER = BLPF 1630/ 5214/ -42
HEDAG2 MIN. MAX VALUES = 0.07 @ -8.25 , 52.16 @ 73.98

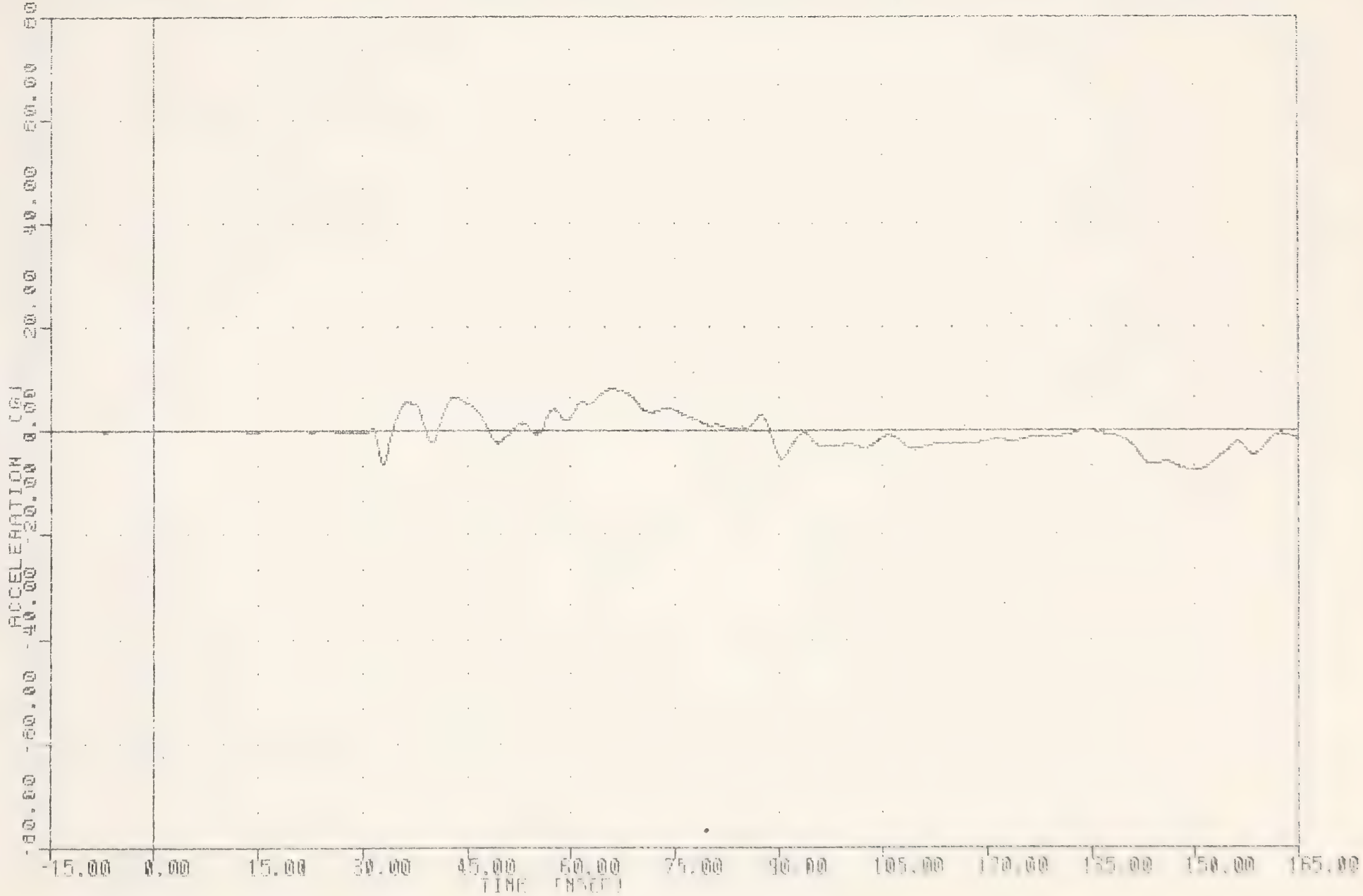


HEAD ACCELERATION RESULTANT PASSENGER

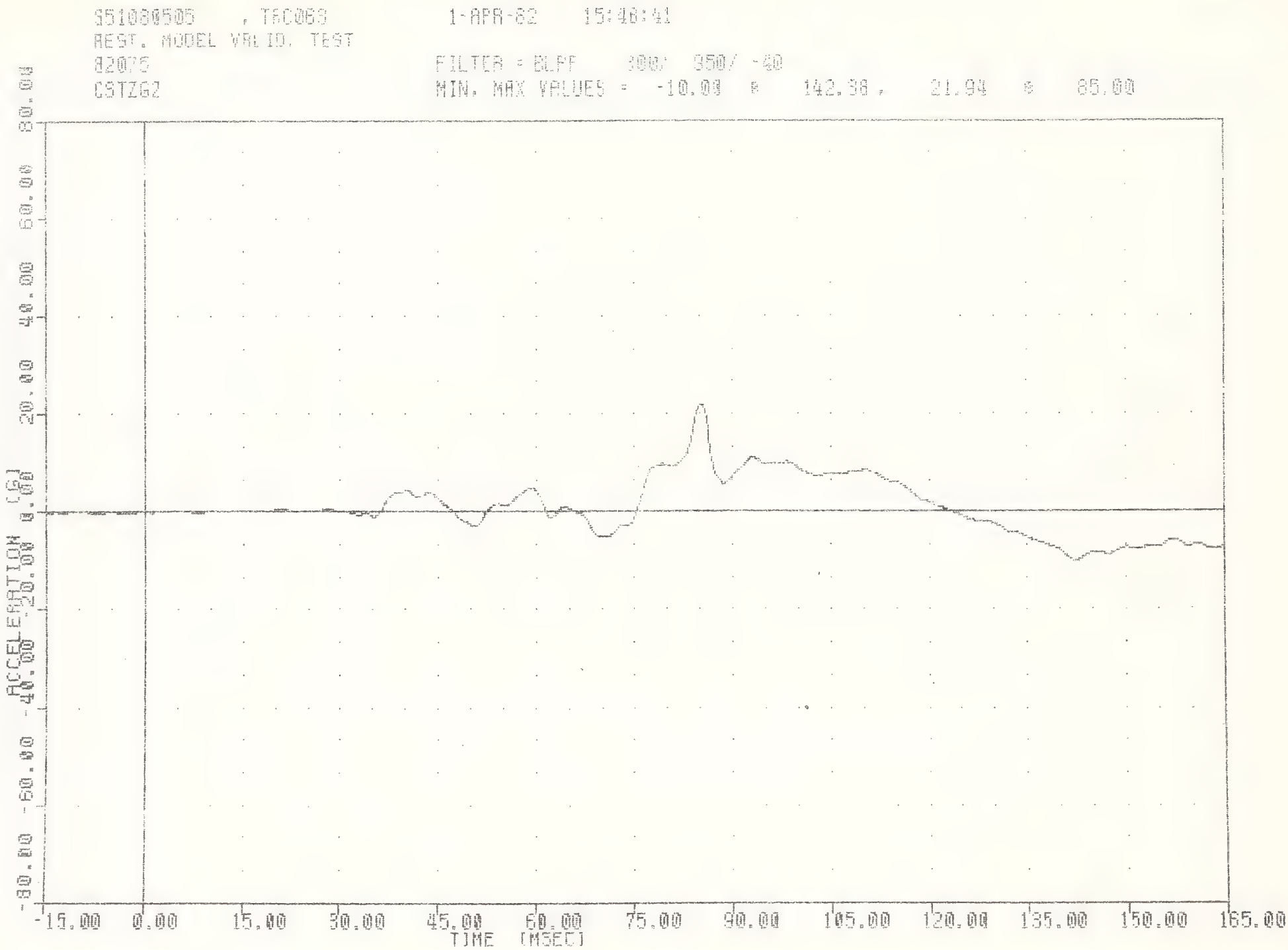


CHEST ACCELERATION X AXIS PASSENGER

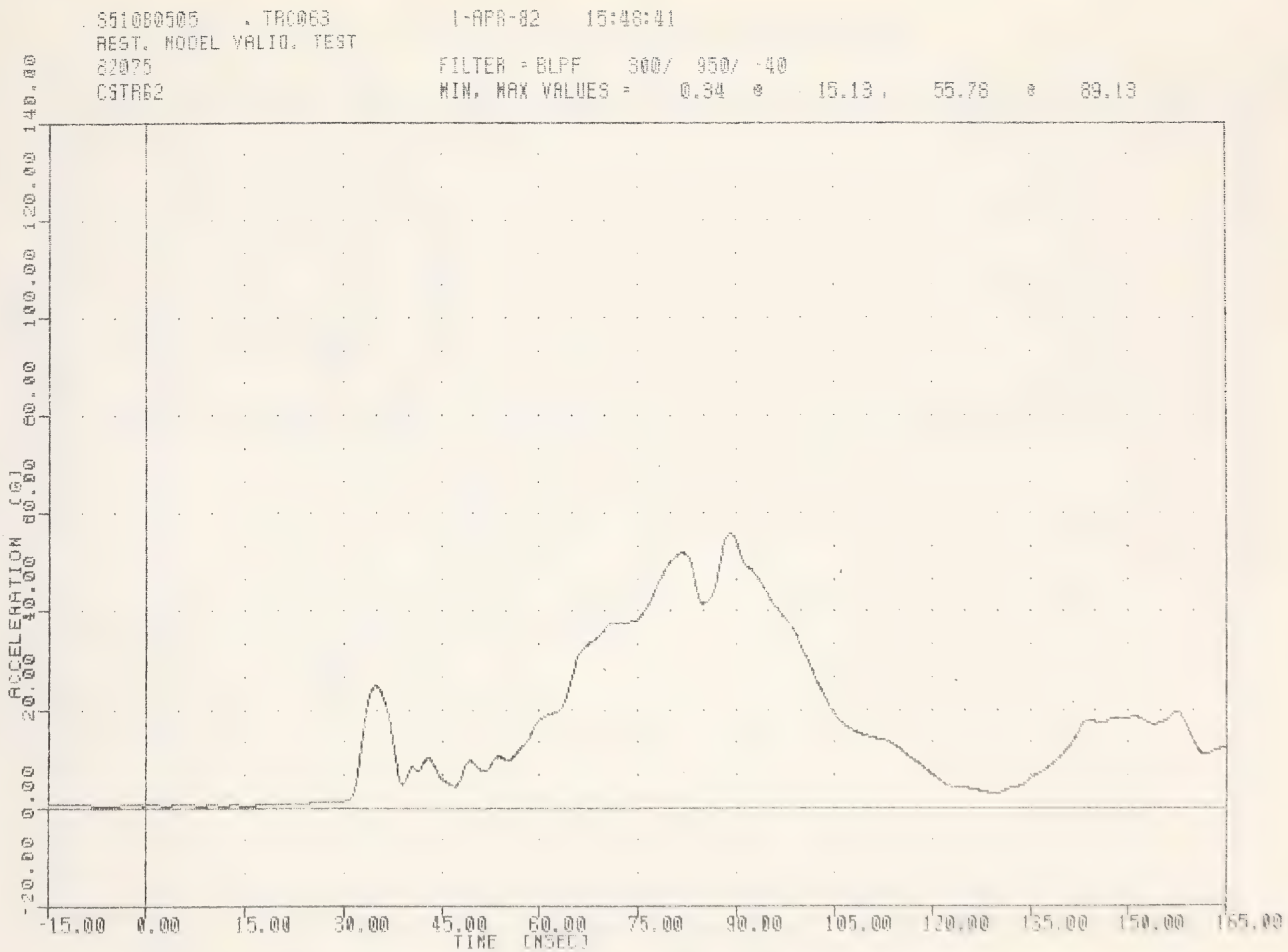
S510B0505 , TR0083 1-APR-82 15:48:41
BEST, MODEL VALID. TEST
82075 FILTER = BLPF 300/ 950/ -40
CSTY62 MIN, MAX VALUES = -7.58 @ 149.60 , 8.05 @ 85.75



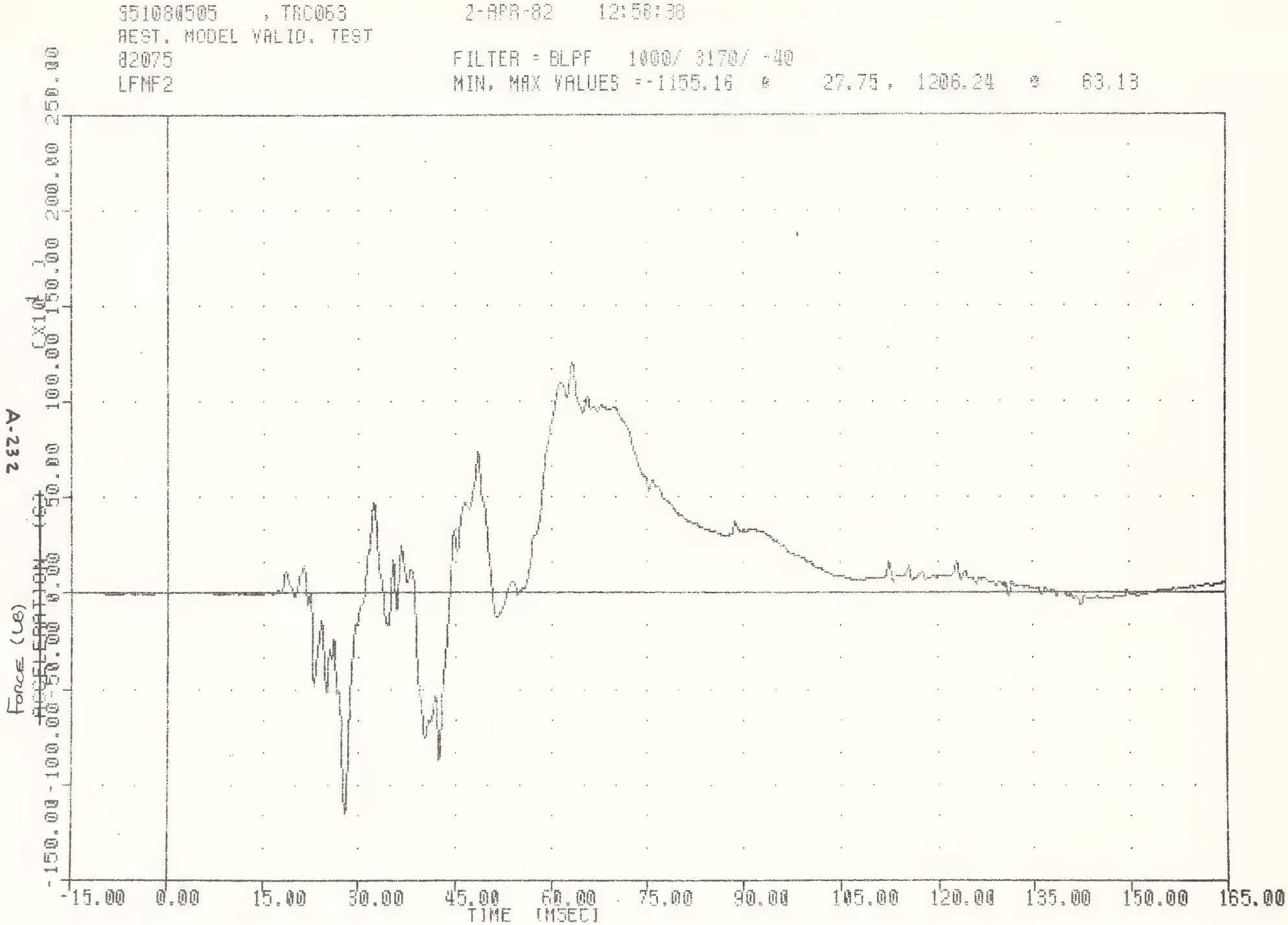
CHEST ACCELERATION X AXIS PASSENGER



CHEST ACCELERATION Z AXIS PASSENGER

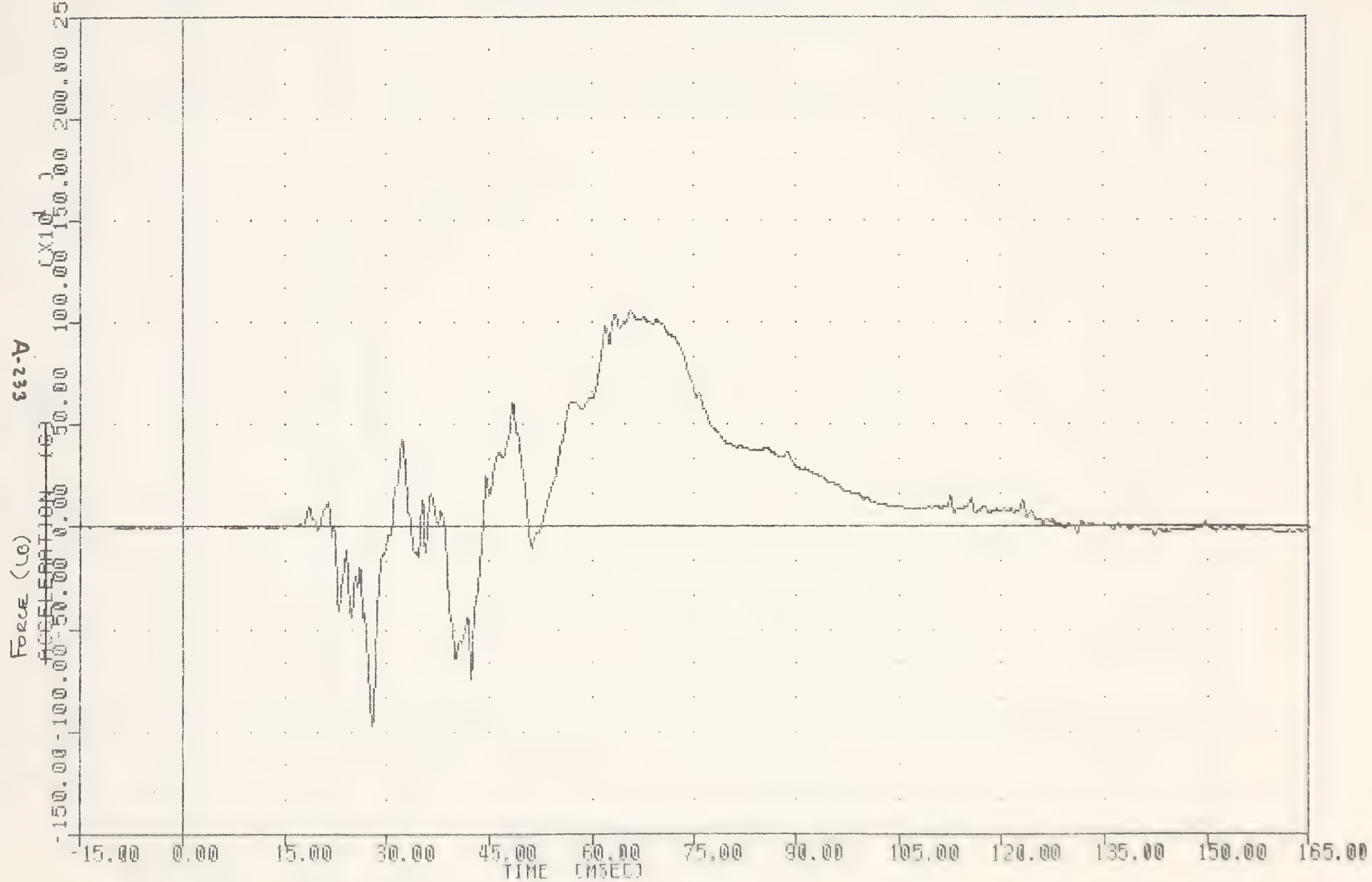


CHEST ACCELERATION RESULTANT PASSENGER



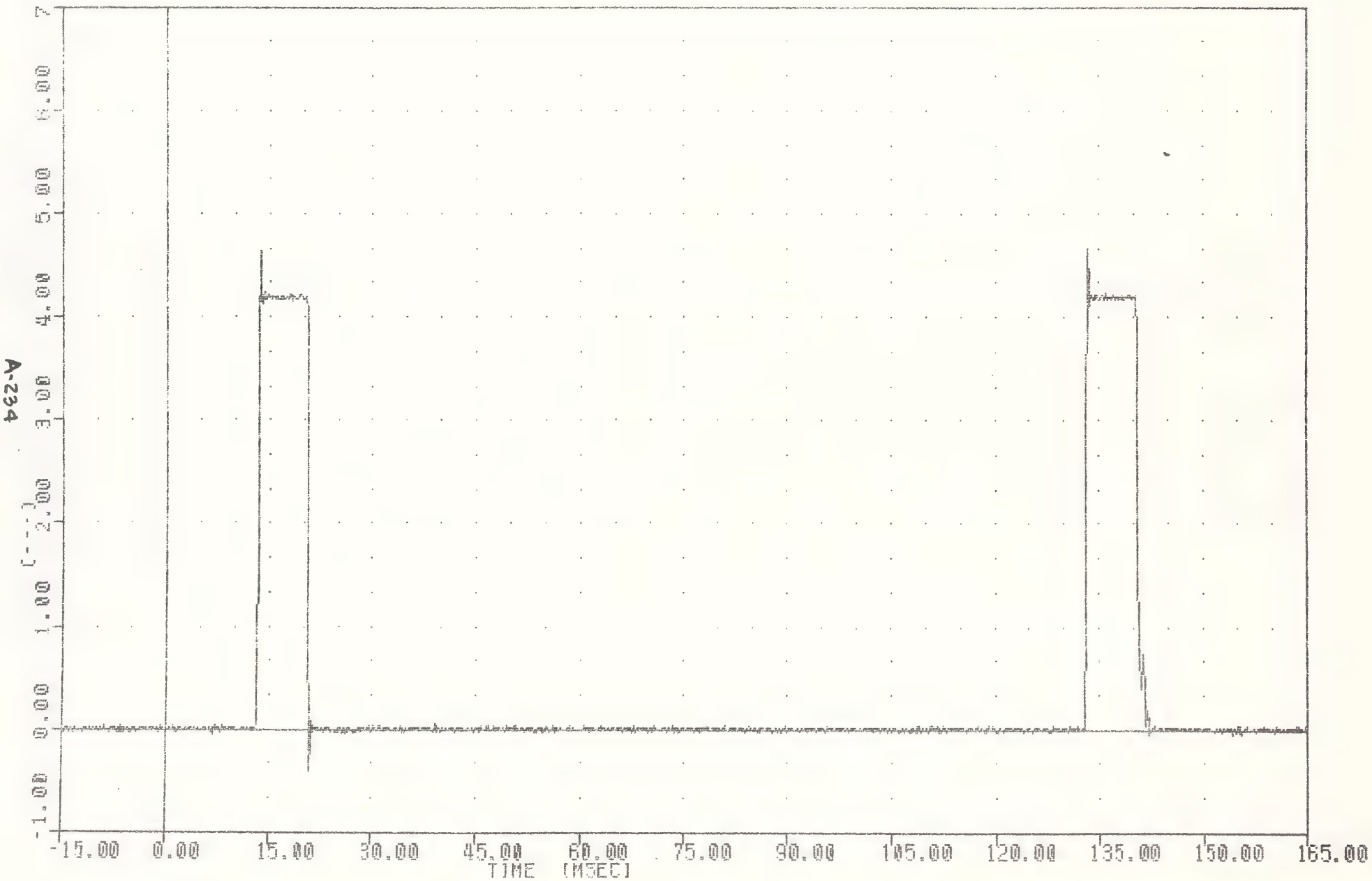
LEFT FEMUR FORCE PASSENGER

S51080505 , TRC063 2-APR-82 12:58:38
REST. MODEL VALID. TEST
82075 FILTER = BLPF 1000/ 3170/ -40
RFNF2 MIN, MAX VALUES = -974.61 @ 27.75 , 1052.93 @ 65.50



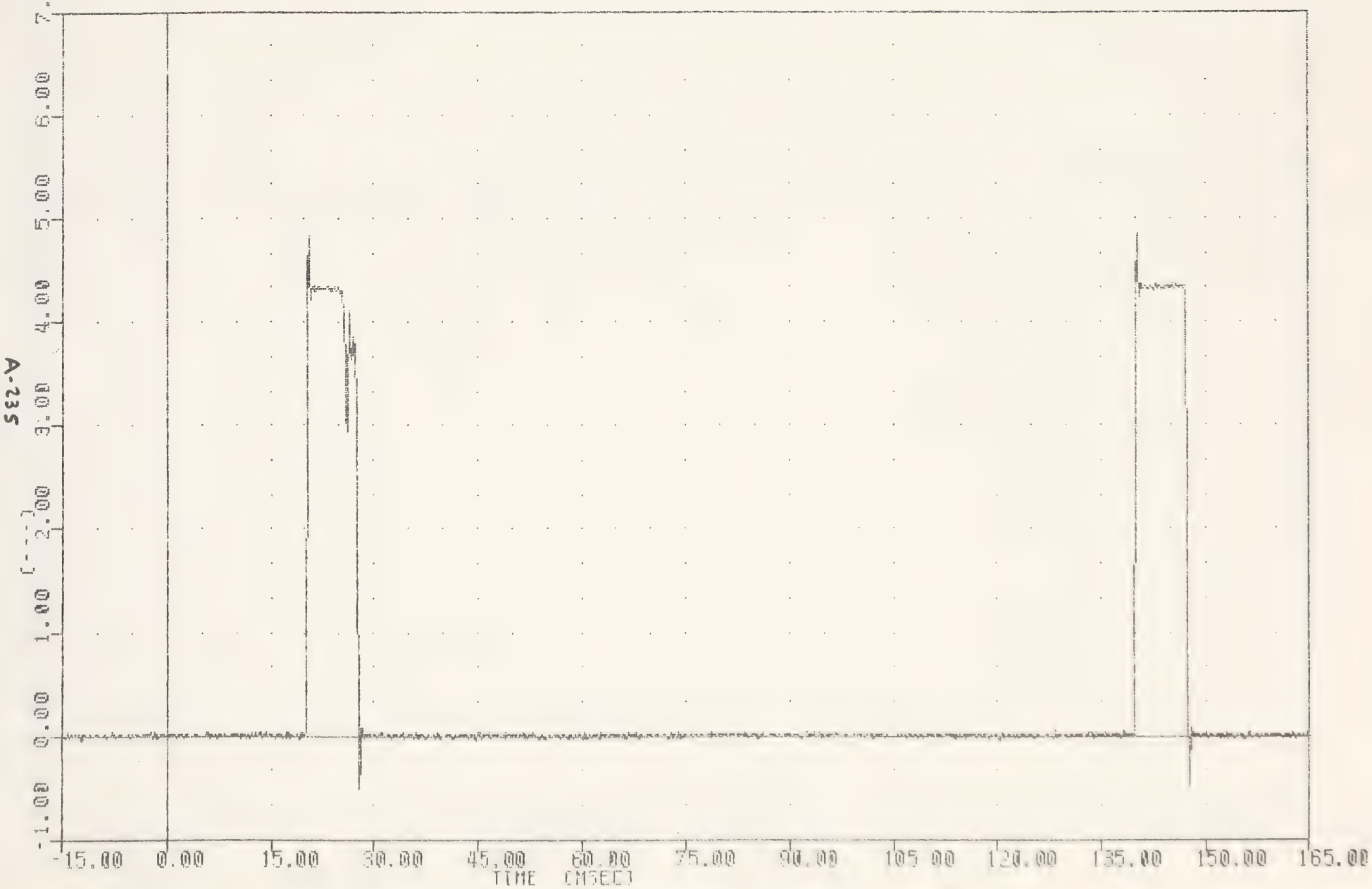
RIGHT FEMUR FORCE PASSENGER

S51080505 , TRC063 1-APR-82 15:46:41
AEST. MODEL VALID. TEST
82075 FILTER = ALPF 1650/ 5214/ -40
ABFT2 MIN. MAX VALUES = -0.41 @ 20.88 , 4.66 @ 133.25



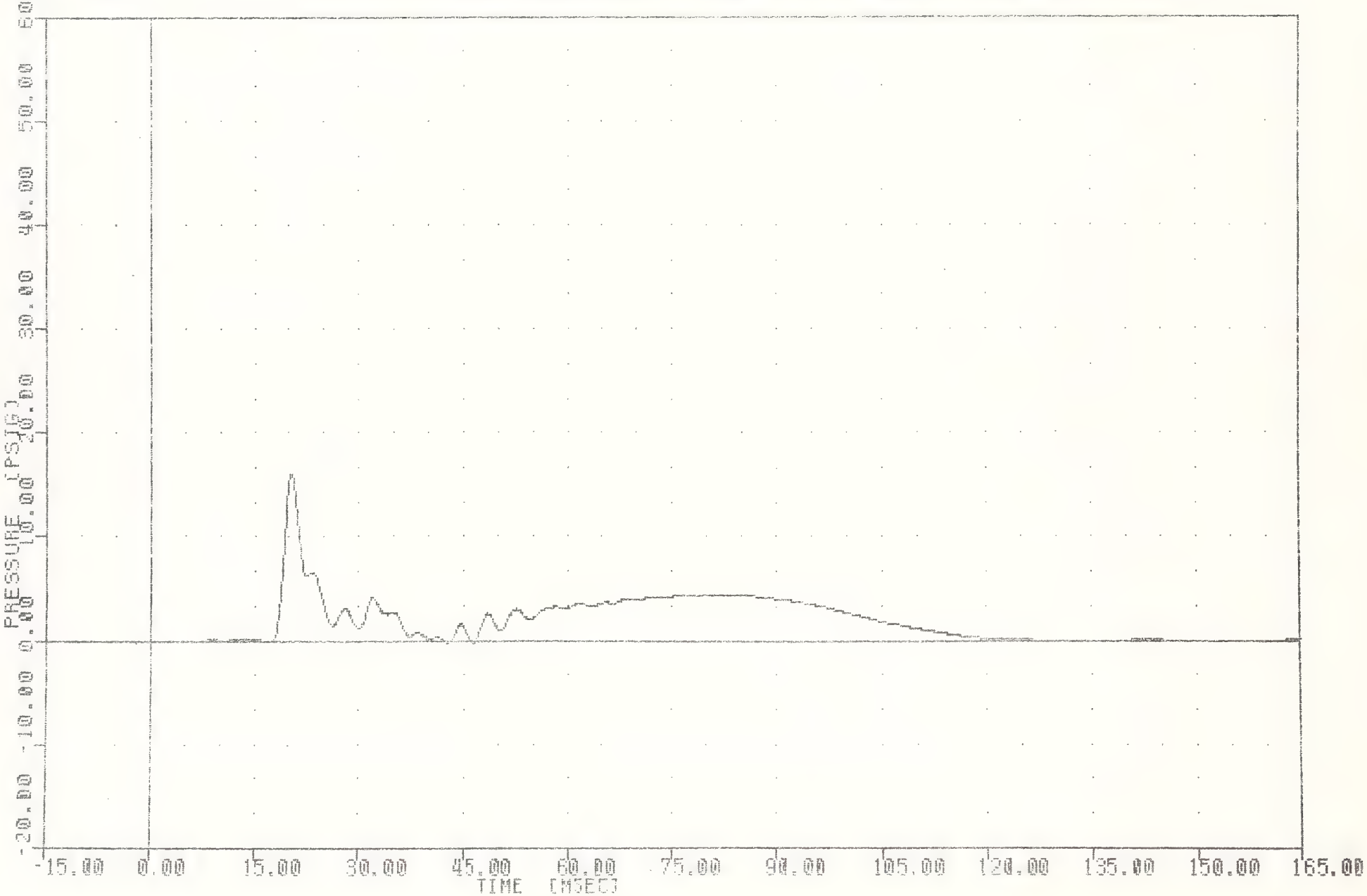
AIR BAG FIRING EVENT PASSENGER

S51080505 , TRC063 1-APR-82 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = ALPF 1650/ 5214/ -40
ABFT3 MIN. MAX VALUES = -0.51 @ 27.75 , 4.85 @ 140.13

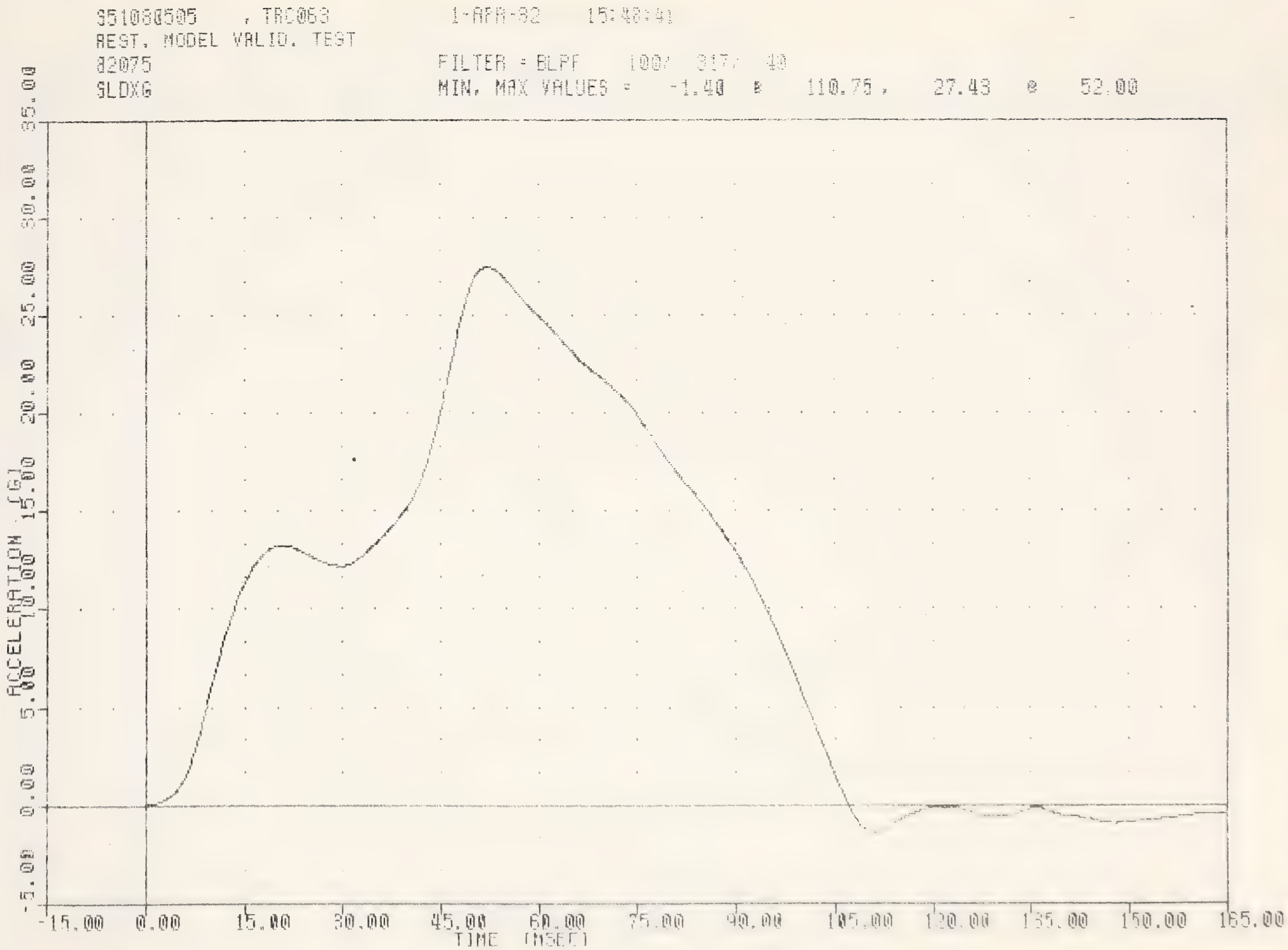


AIR BAG FIRING EVENT 3

S510800505 , TRC363 1-APR-82 15:48:41
REST. MODEL VALID. TEST.
82075 FILTER = BLPF 300/ 950/ -40
ABP2 MIN, MAX VALUES = -0.24 @ 48.25 , 15.97 @ 20.13

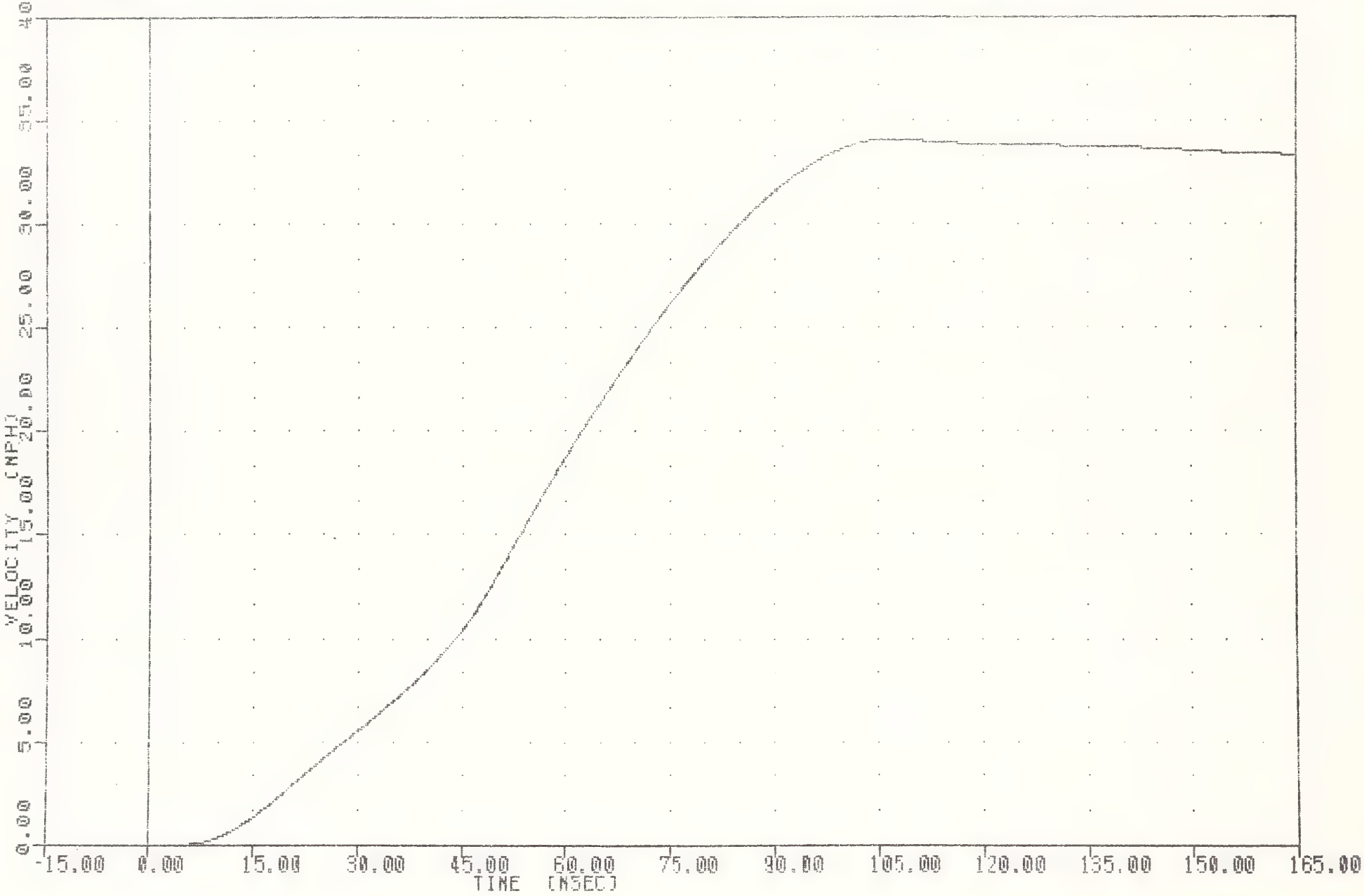


AIR BAG PRESSURE PASSENGER

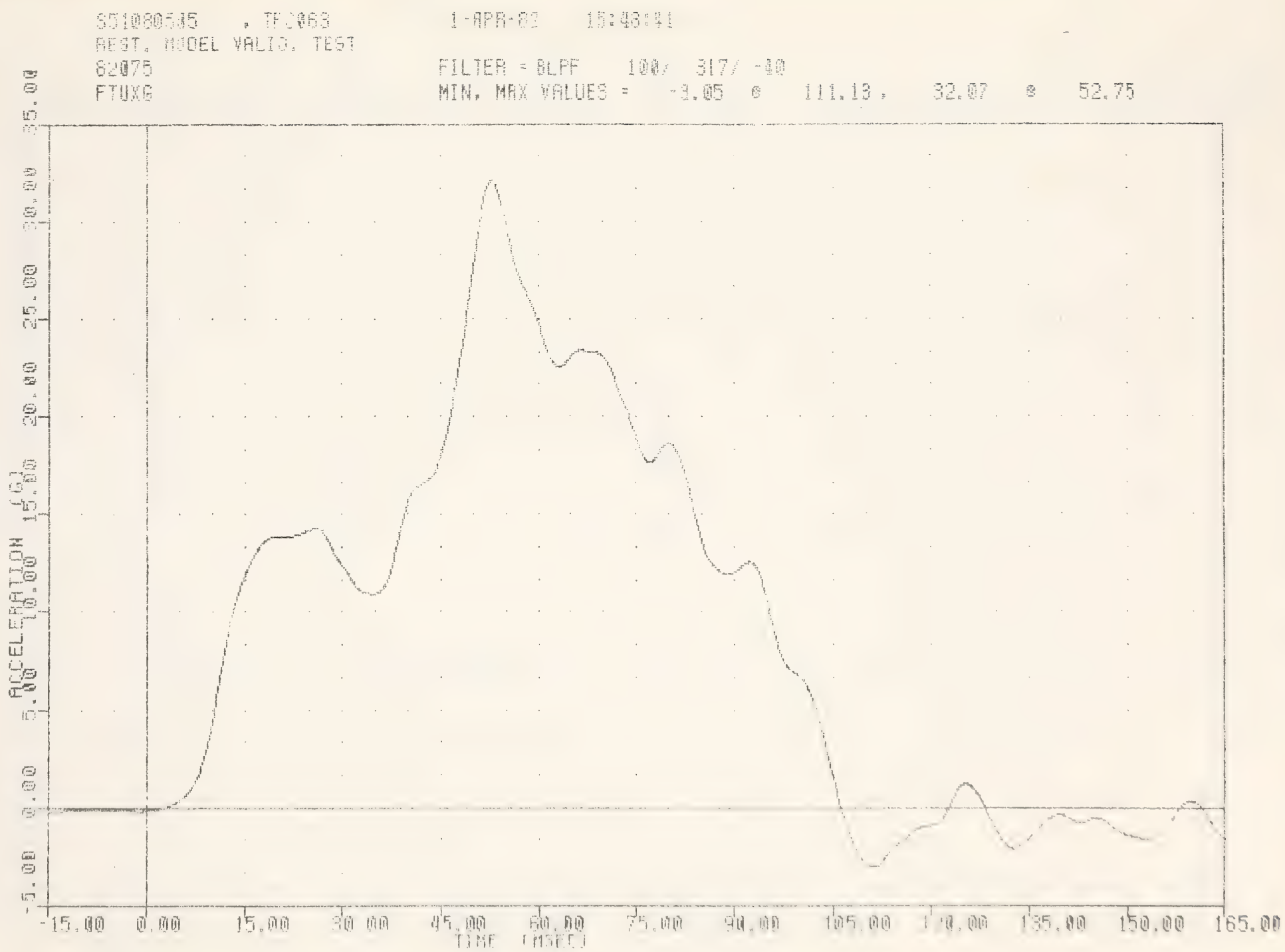


SLED ACCELERATION

S510B0505 , TRC063 1-APR-92 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = BLPF 100/ 617/ 40
SLOXV MIN. MAX VALUES = -0.02 @ -0.13 , 34.06 @ 106.88

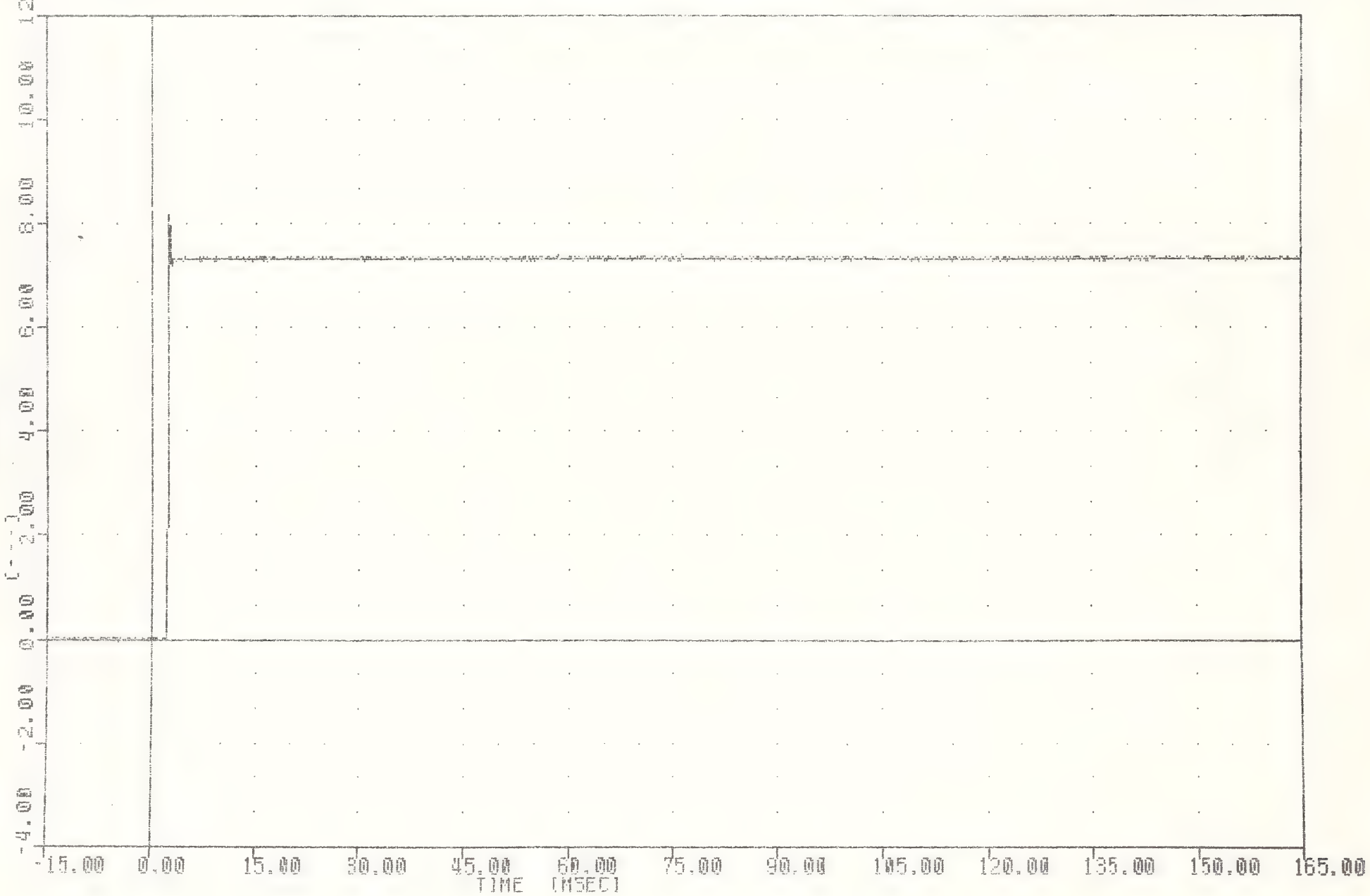


SLED VELOCITY IN MPH



FLOOR PAN TUNNEL ACCELERATION

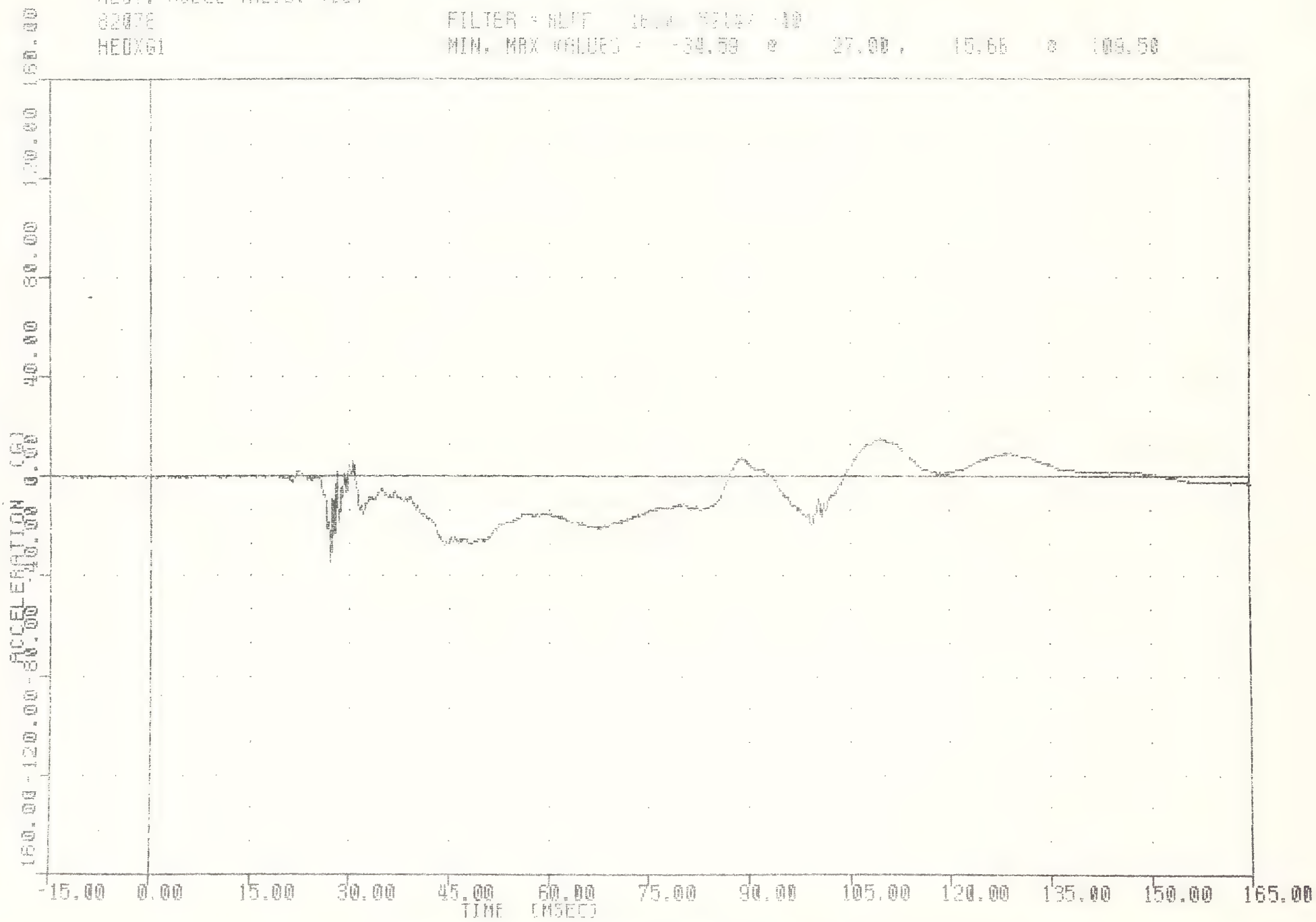
S5108@505 , TRC@63 1-APR-82 15:48:41
REST. MODEL VALID. TEST
82075 FILTER = ALPF 1650/ 5214/ -40
SPSW MIN. MAX VALUES = -0.05 @ -4.88 , 8.18 @ 2.38



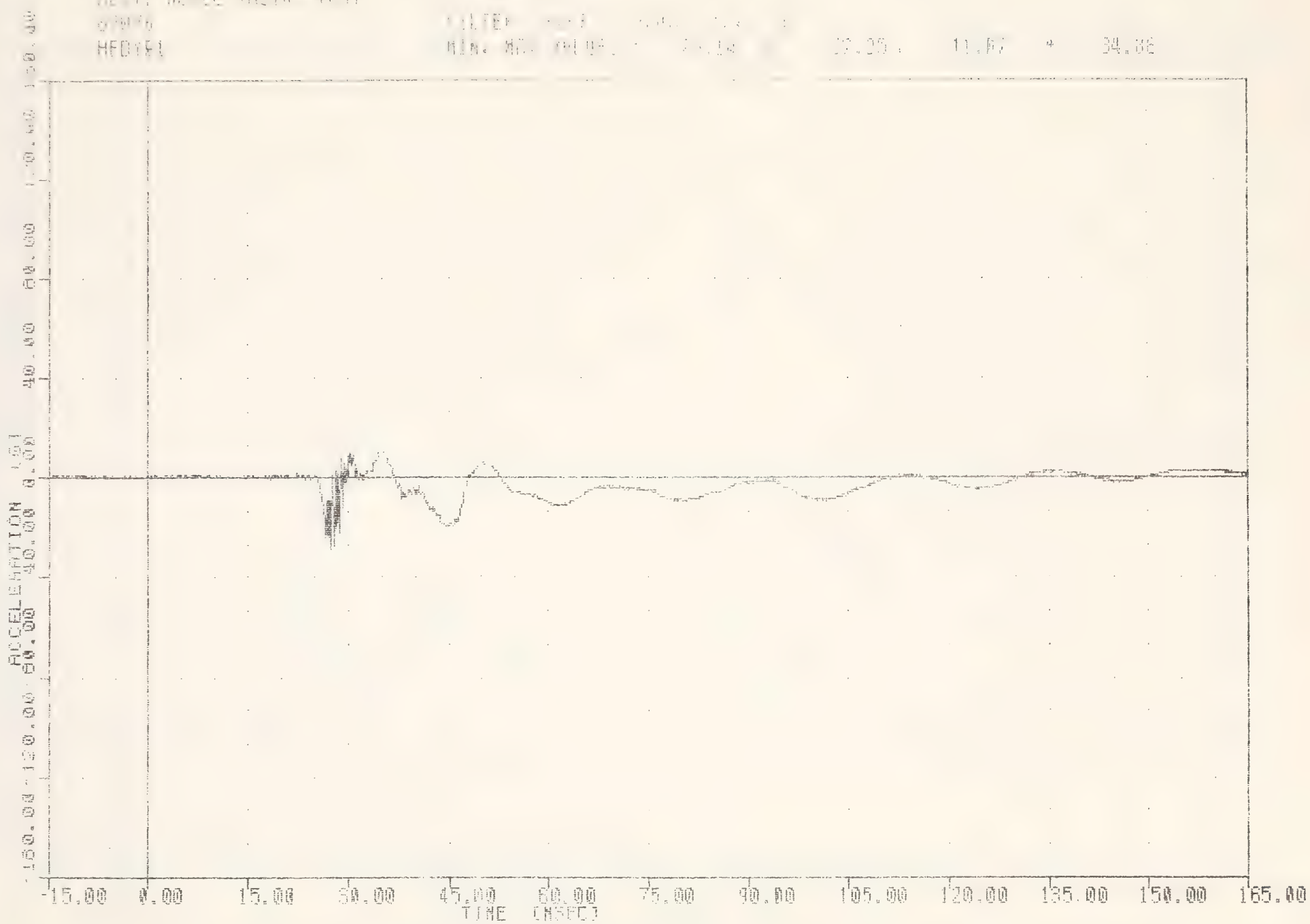
SLED POSITION SWITCH

TEST NO. 9

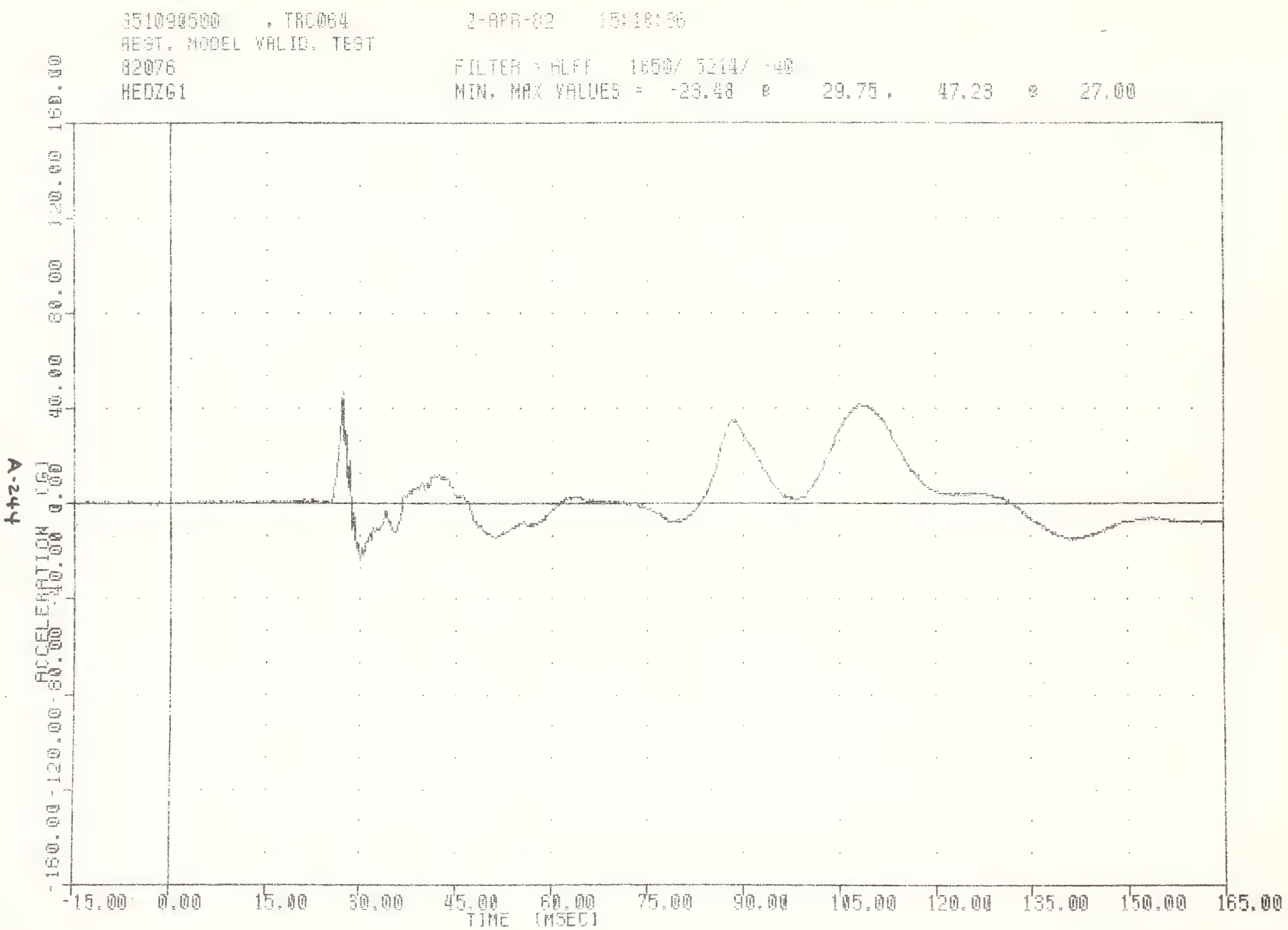
551090500 , TRC064 2-APR-87
REST. MODEL VALID. TEST
82072E FILTER = NONE
HEDXG1 MIN. MAX VALUES = -34.58 @ 27.00 , 15.66 @ 109.50



HEAD ACCELERATION X AXIS DRIVER

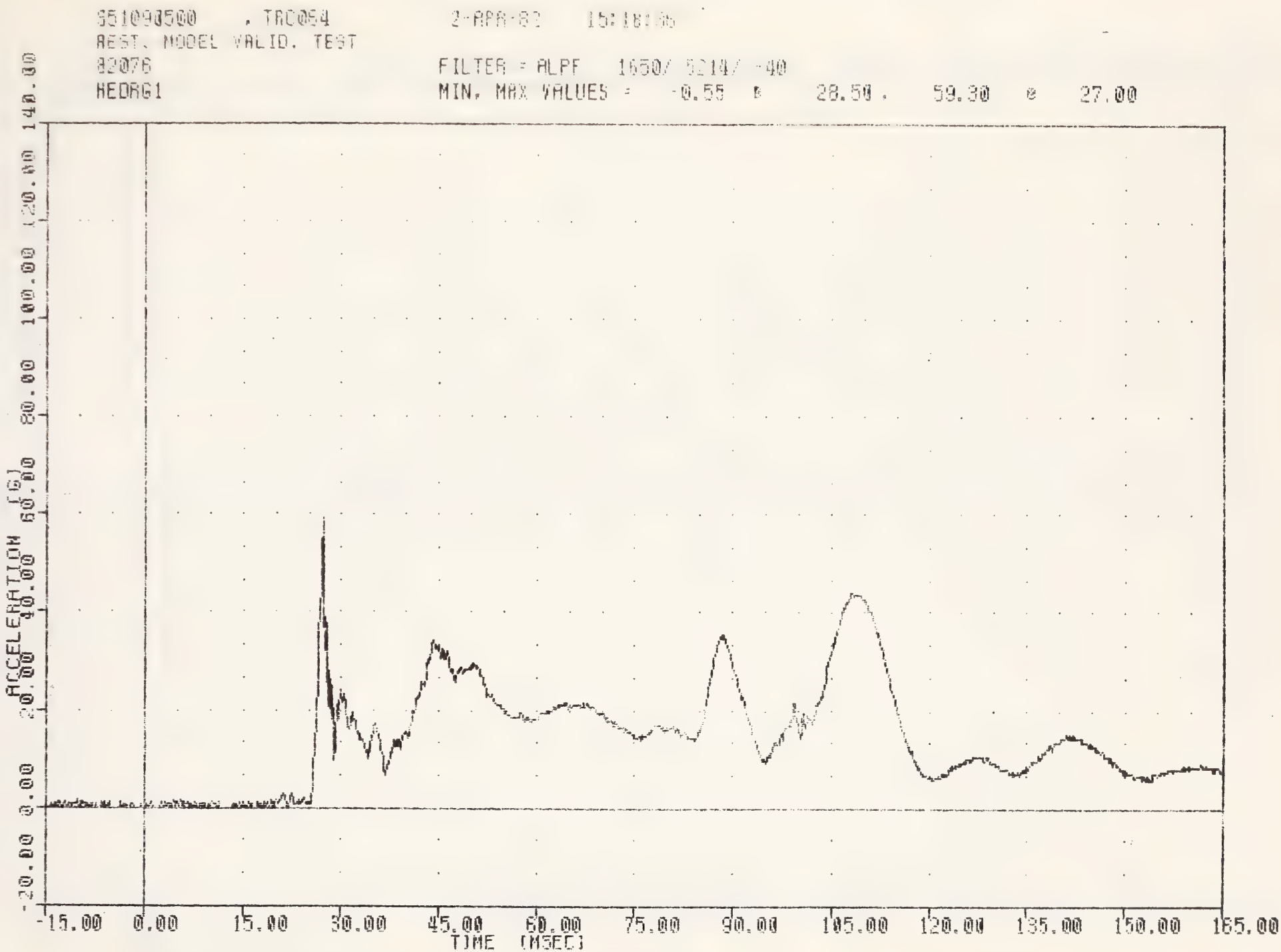


HEAD ACCELERATION Y AXIS DRIVER



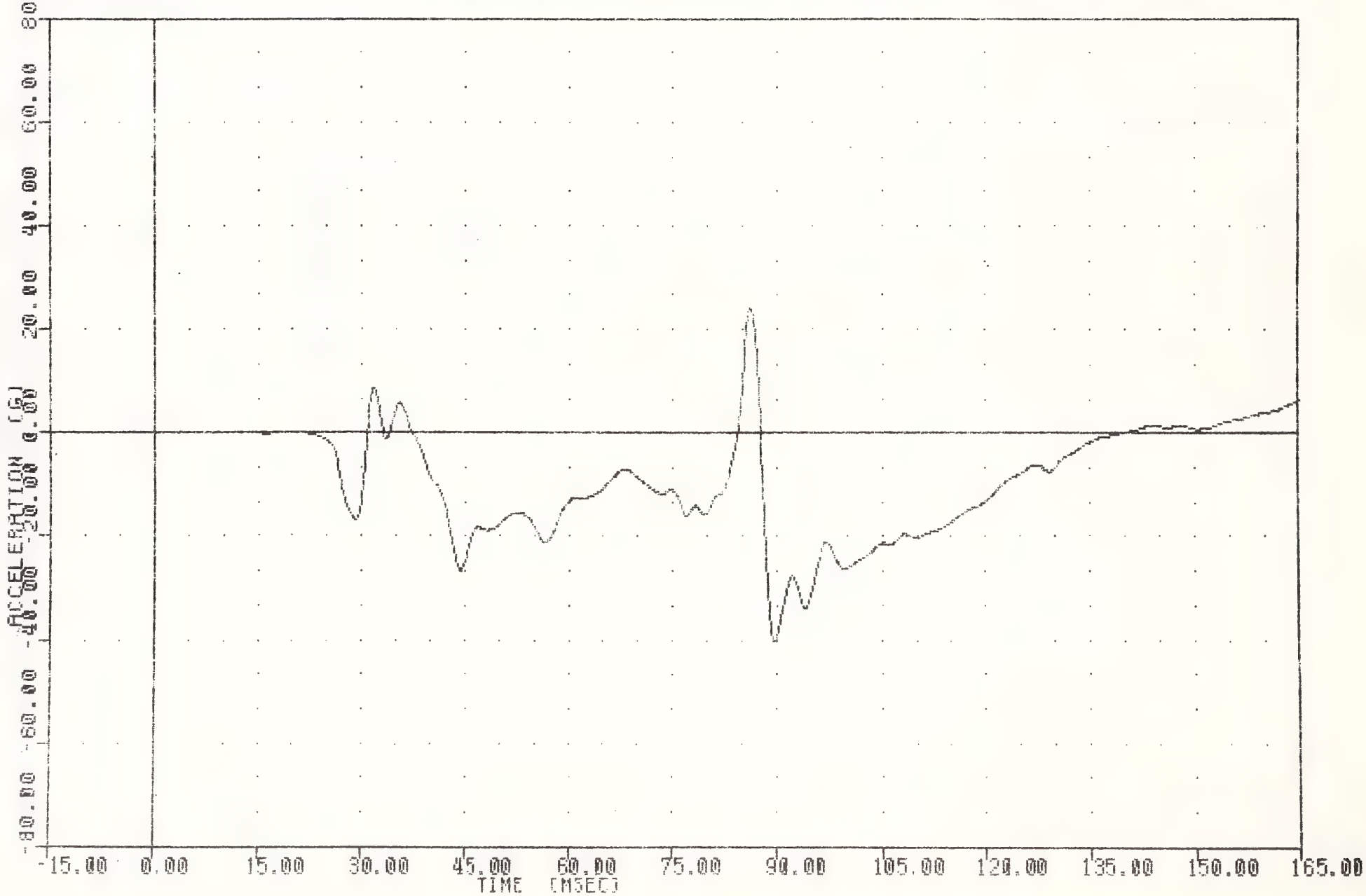
HEAD ACCELERATION Z AXIS DRIVER

A-244



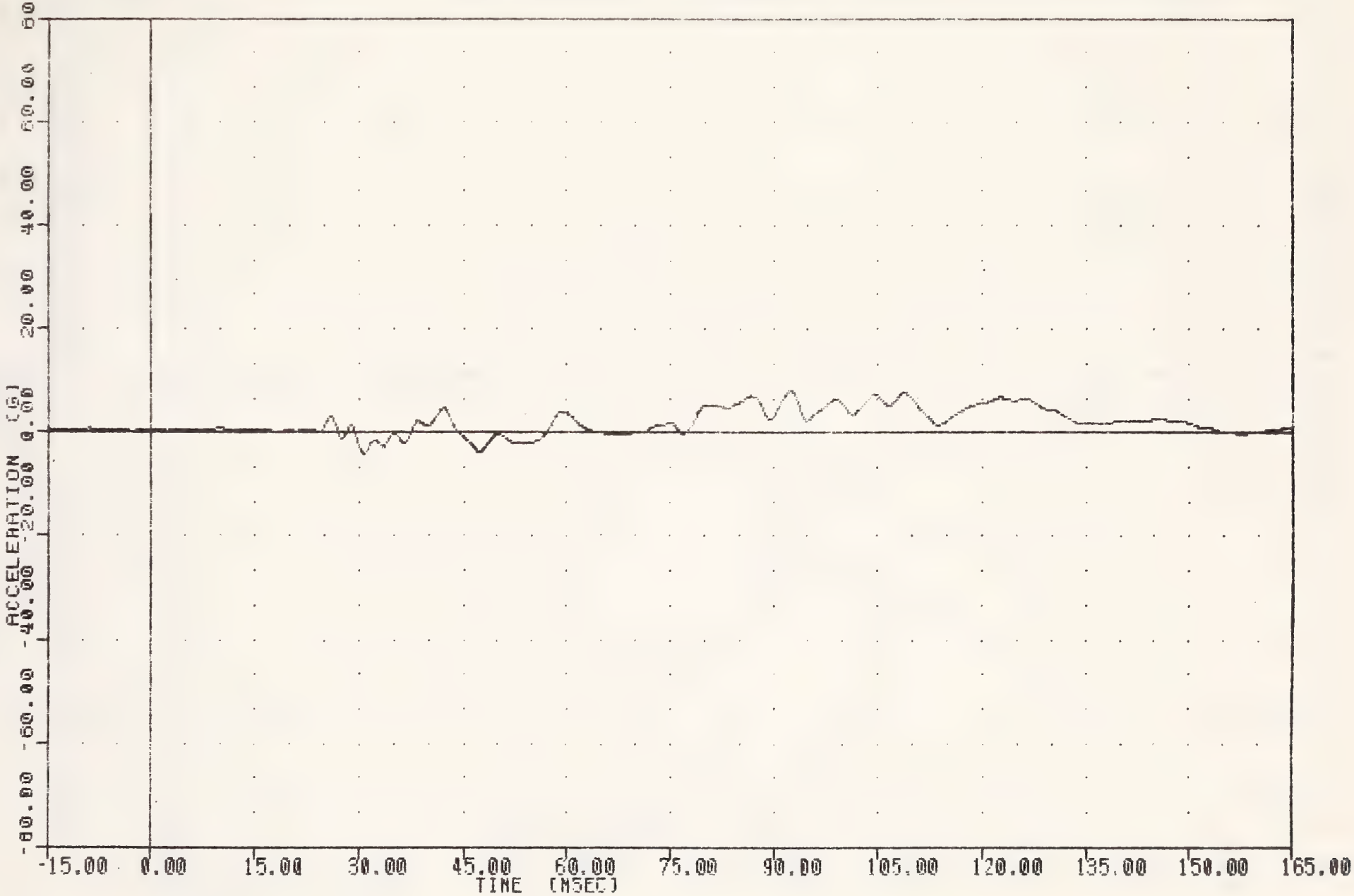
HEAD ACCELERATION RESULTANT DRIVER

S51090500 , TRC064 2-APR-82 15:18:36
REST. MODEL VALID. TEST
82076 FILTER = BLPF 300/ 950/ -10
CSTXG1 MIN. MAX VALUES = -40.66 @ 80.50 , 24.17 @ 86.00

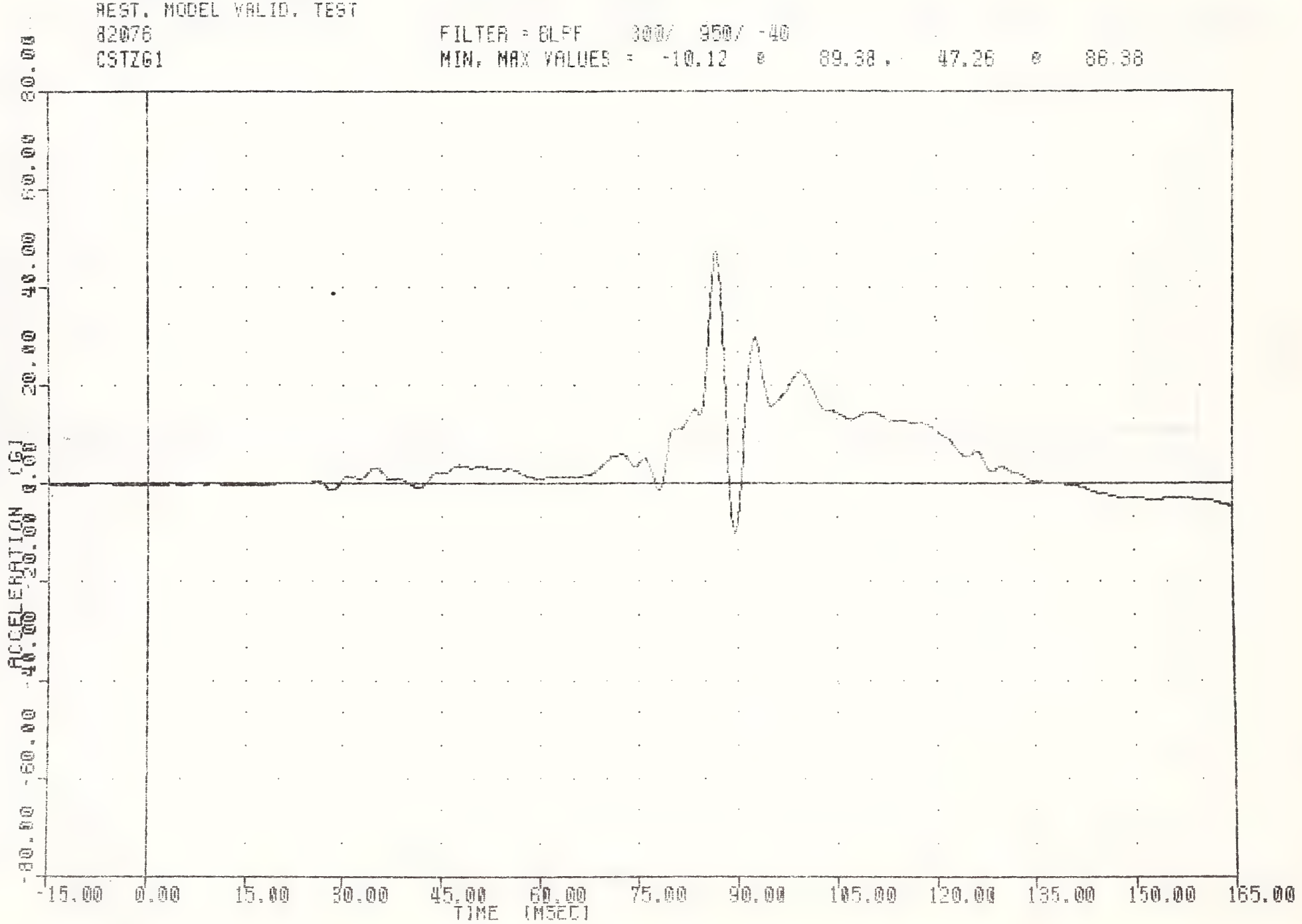


CHEST ACCELERATION X AXIS DRIVER

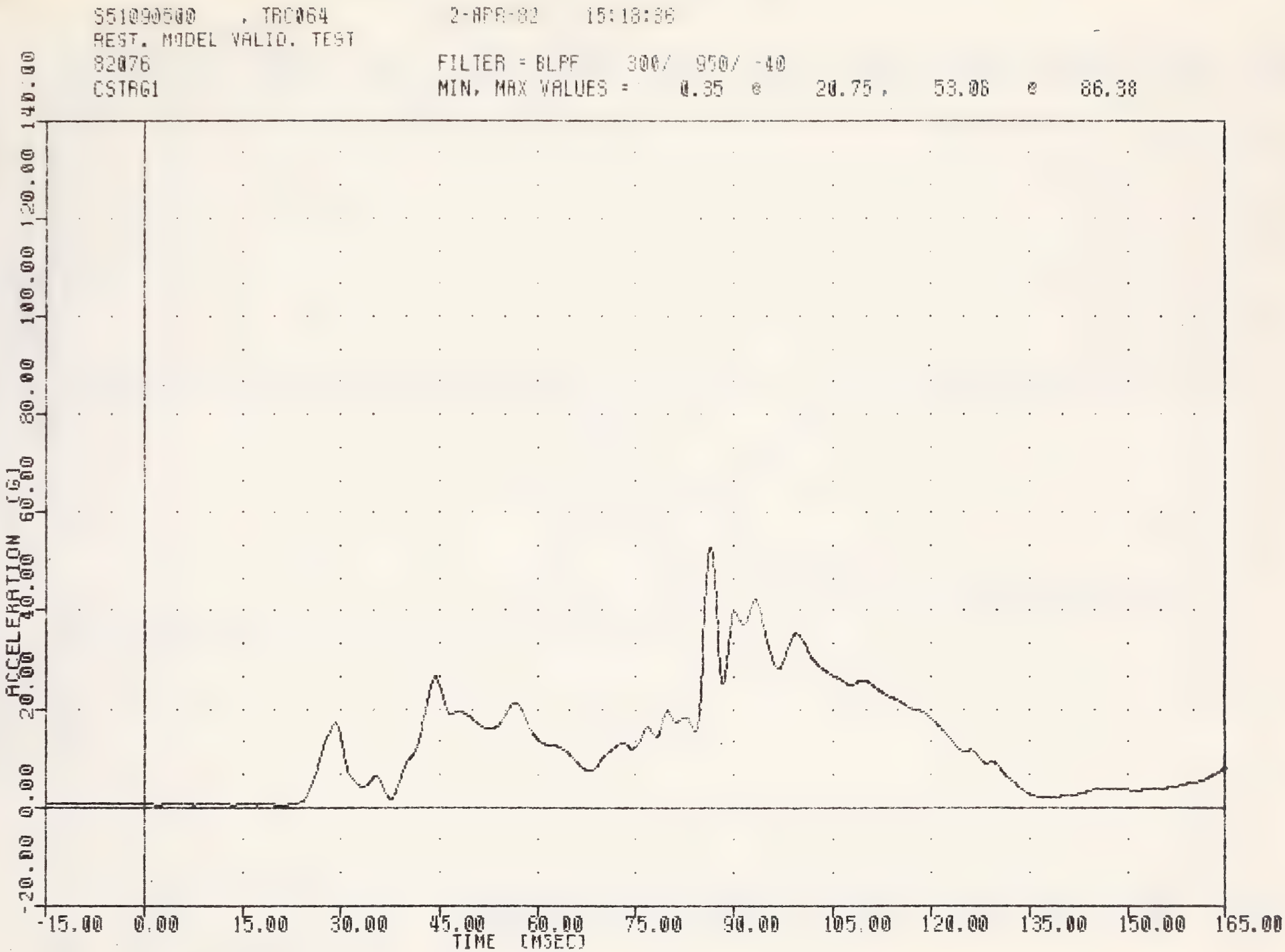
S51090500 , TRC064 2-APR-82 15:18:36
BEST. MODEL VALID. TEST
82076 FILTER = BLPF 300/ 950/ -40
CSTY61 MIN. MAX VALUES = -4.04 @ 30.63 , 8.21 @ 92.38



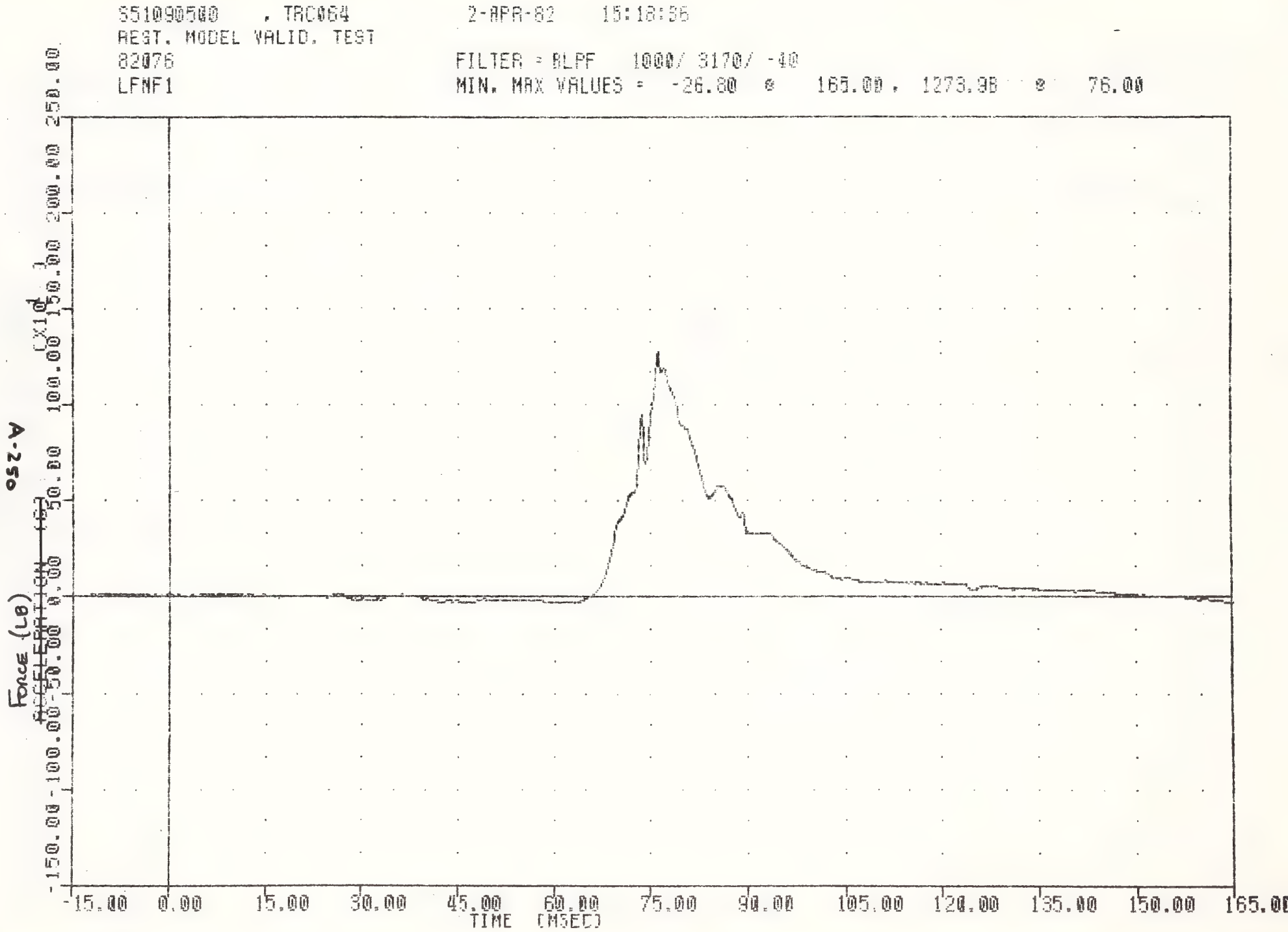
CHEST ACCELERATION Y AXIS DRIVER



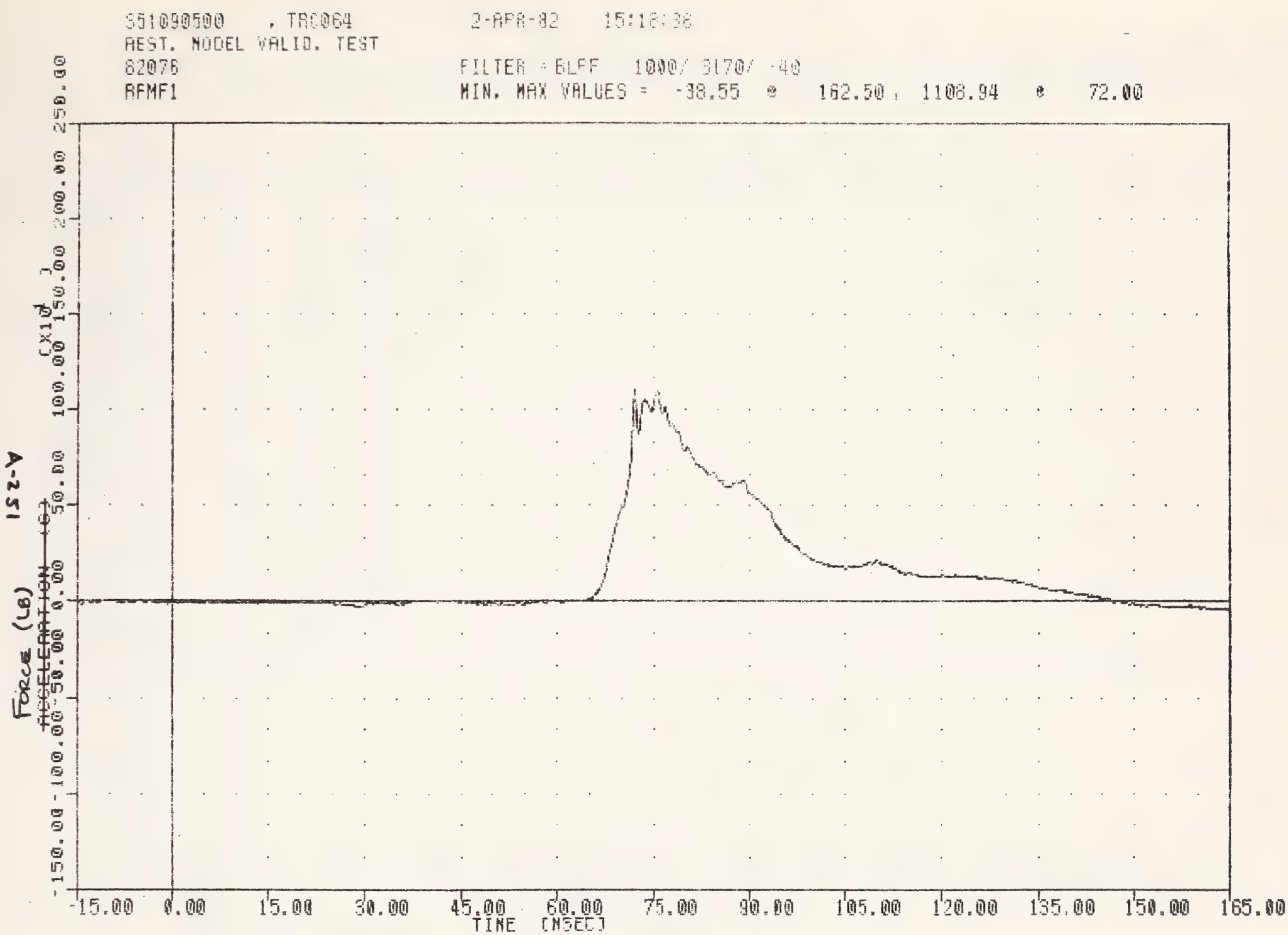
CHEST ACCELERATION Z AXIS DRIVER



CHEST ACCELERATION RESULTANT DRIVER

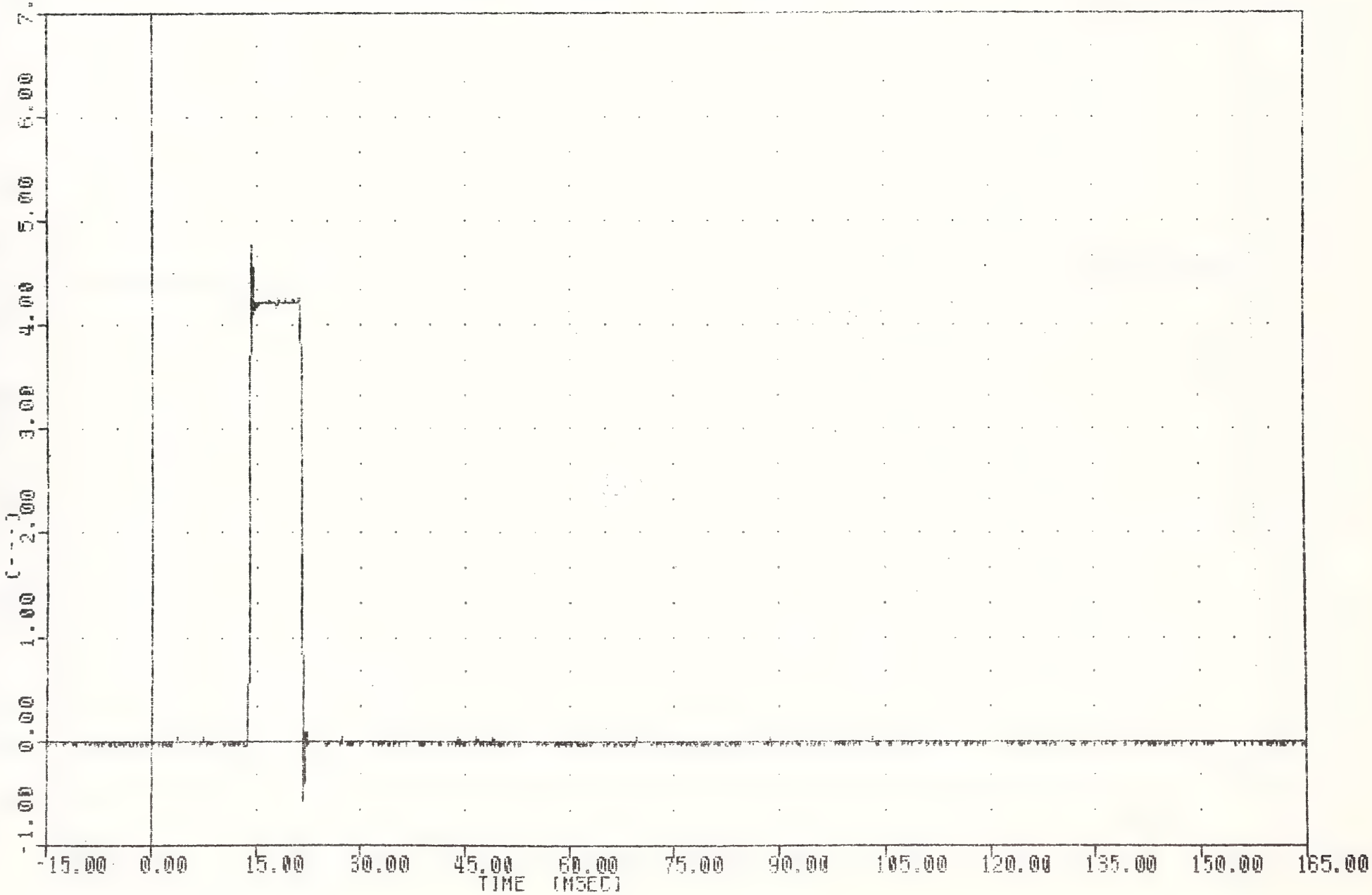


LEFT FEMUR FORCE DRIVER

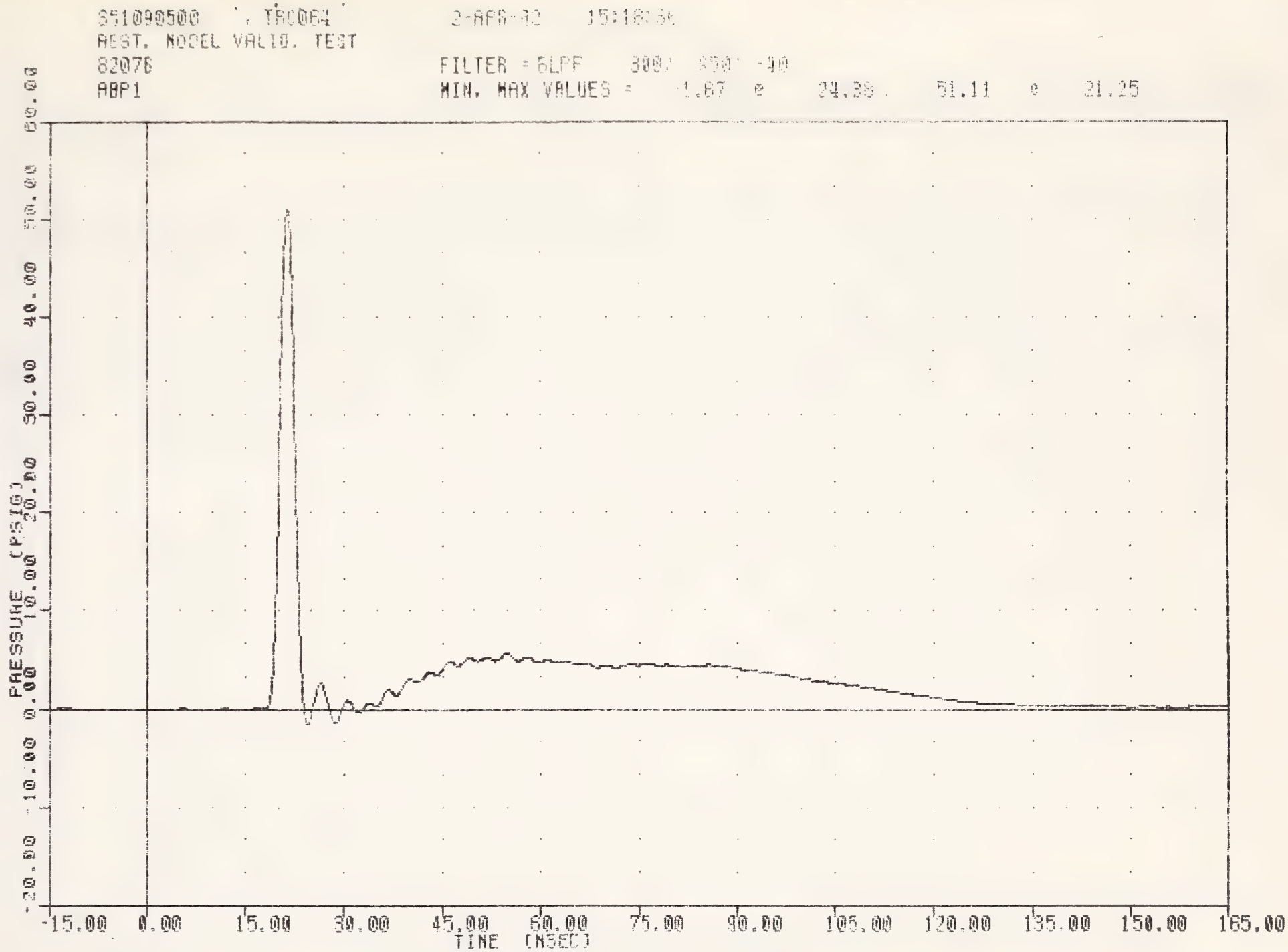


RIGHT FEMUR FORCE DRIVER

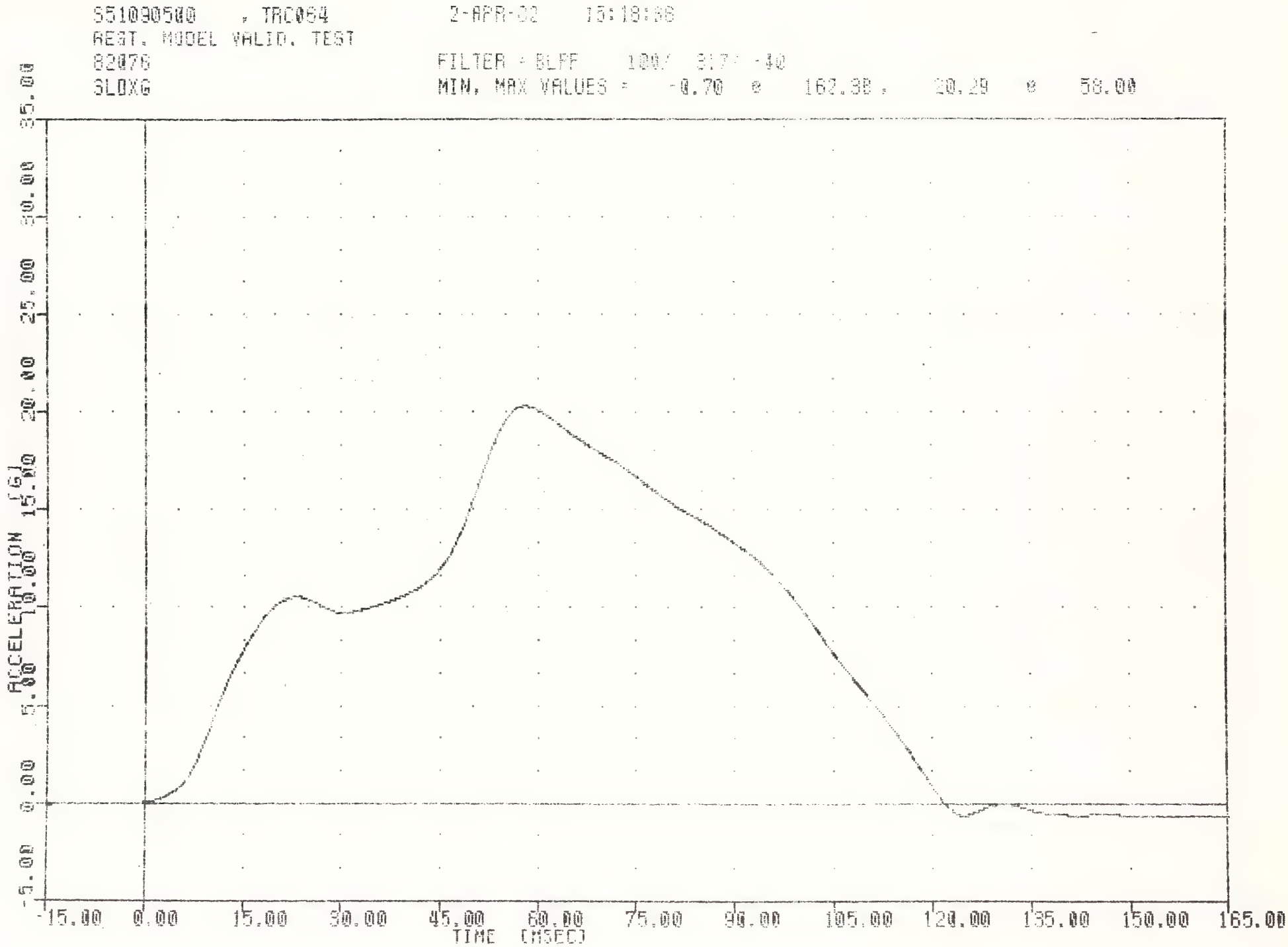
S51090500 , TRC064 2-APR-82 15:18:38
REST. MODEL VALID. TEST
82076 FILTER = ALPF 1650/ 5214/ -40
ABFT1 MIN. MAX VALUES = -0.59 @ 21.63 , 4.76 @ 14.25



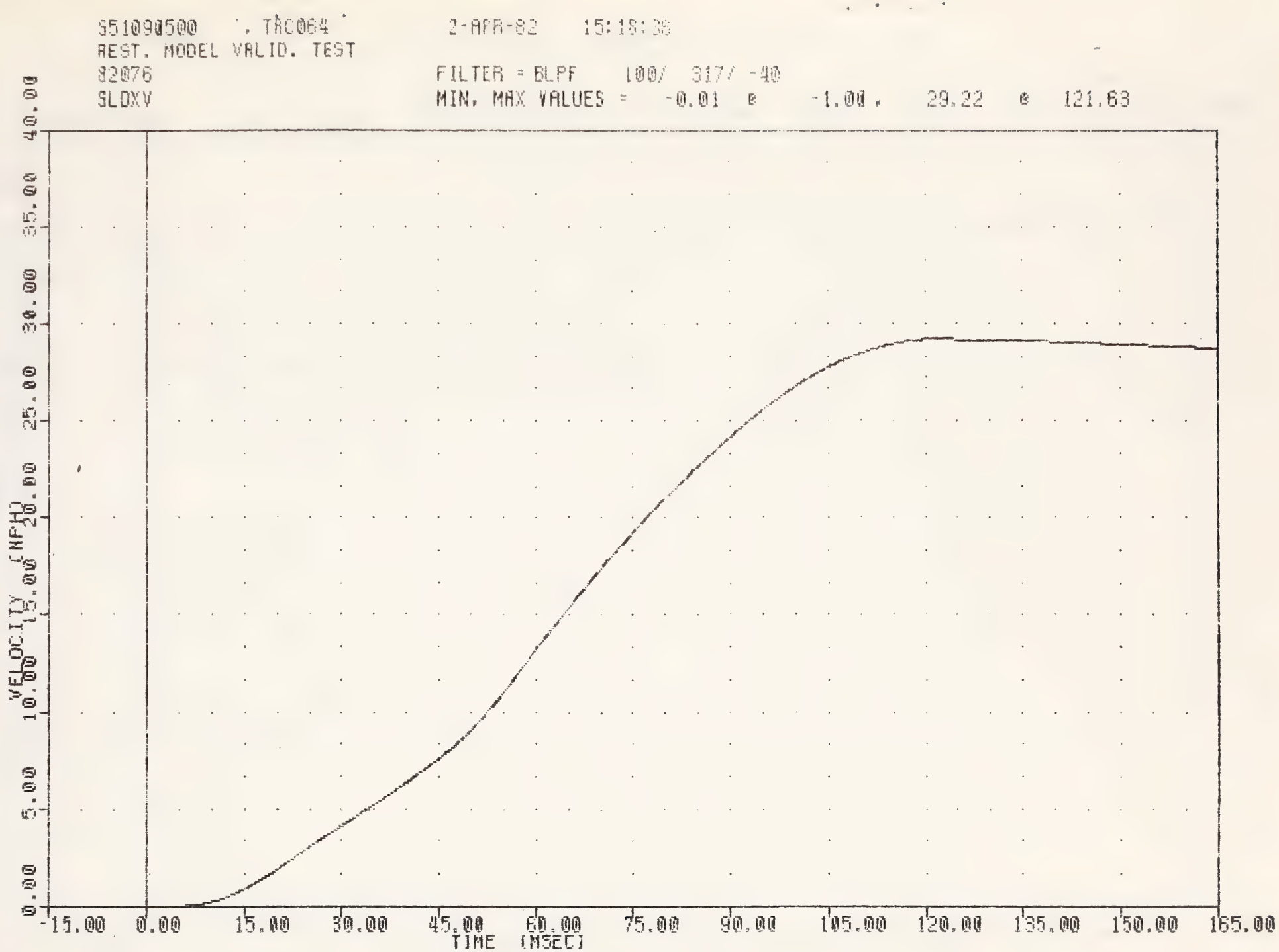
AIR BAG FIRING EVENT DRIVER



AIR BAG PRESSURE DRIVER

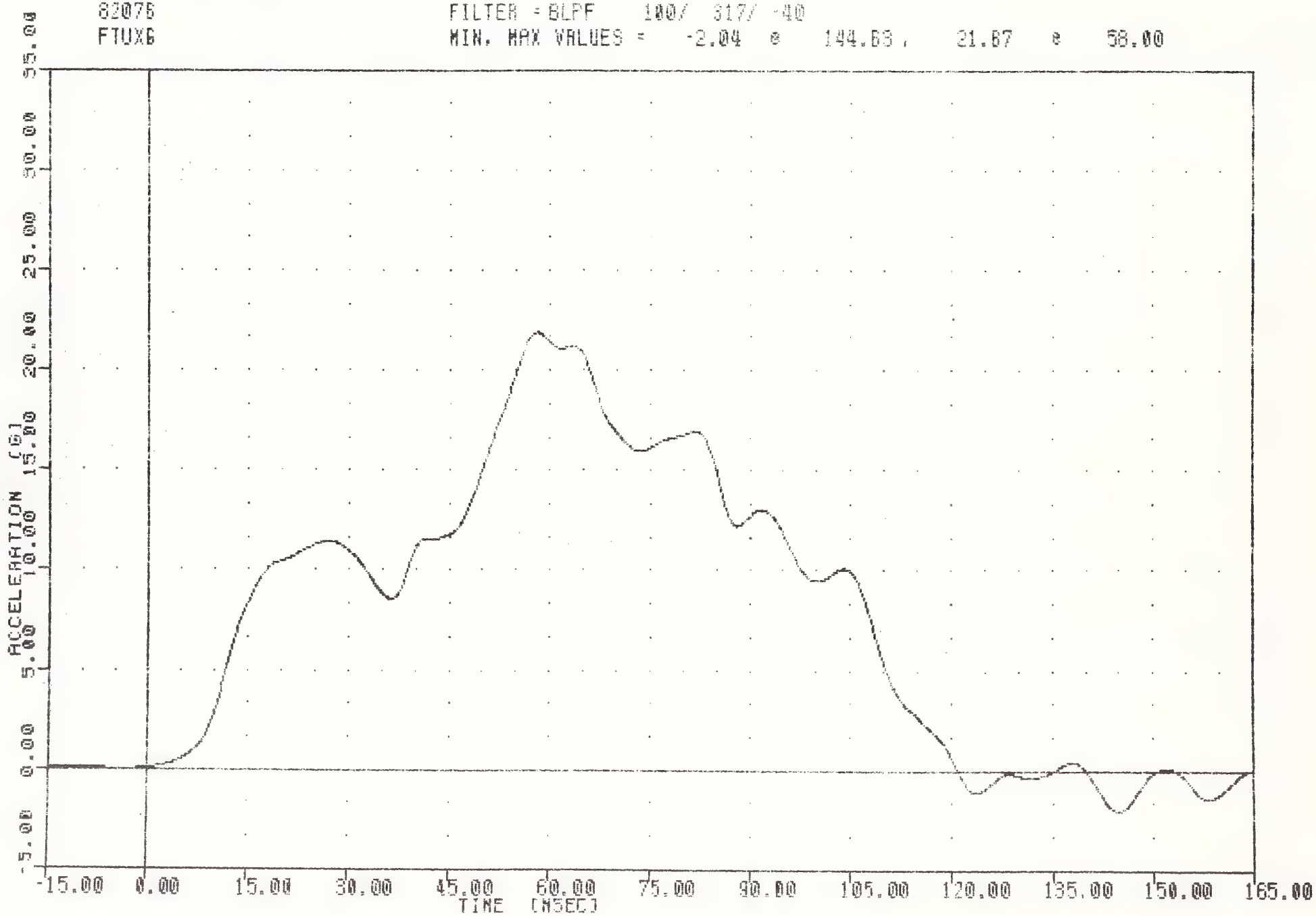


SLED ACCELERATION

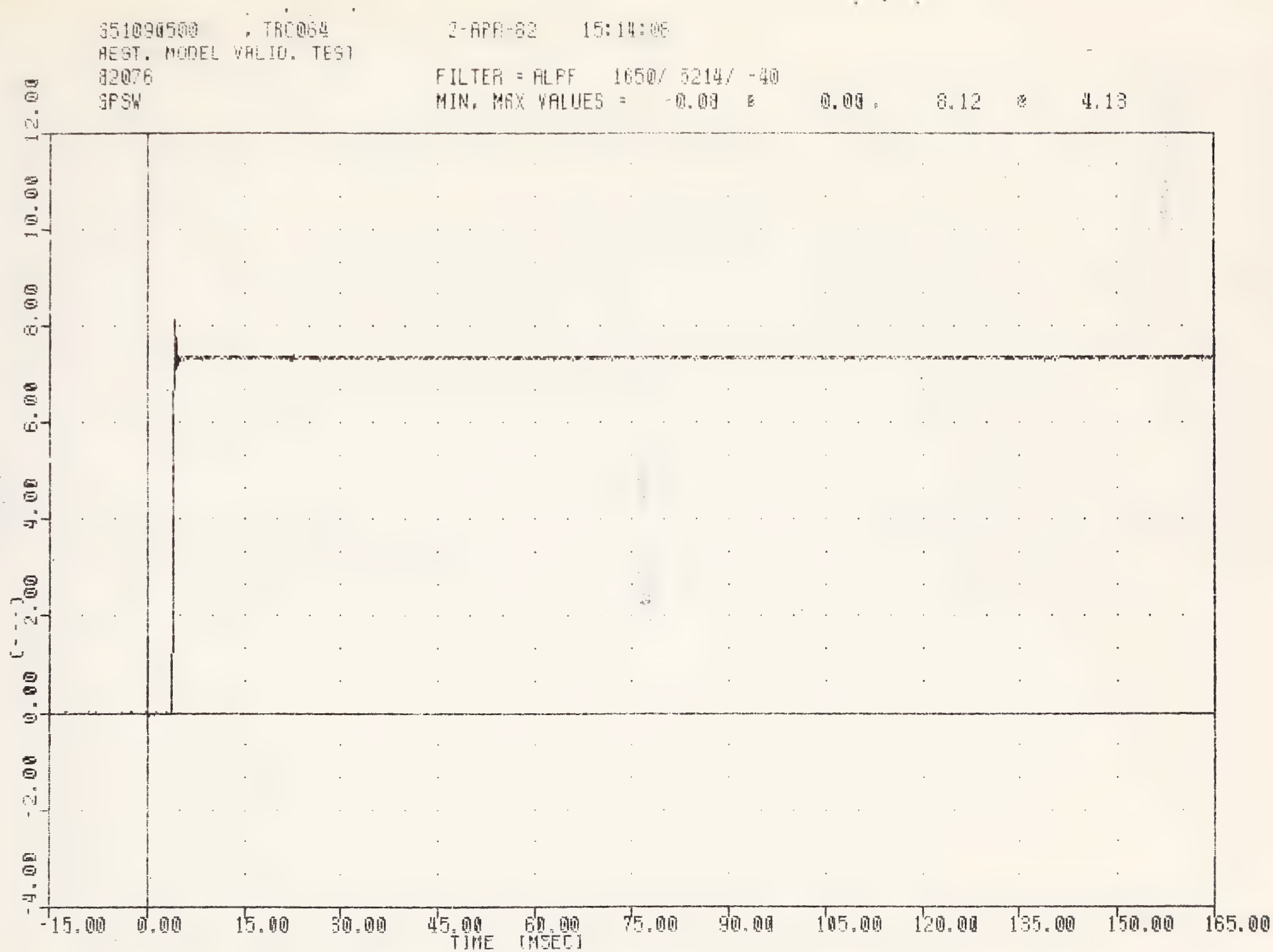


SLED VELOCITY IN MPH

S51090500 . TRC084 2-APR-82 15:18:36
REST. MODEL VALID. TEST
82076 FILTER = BLPF 100/ 317/ -40
FTUXG MIN. MAX VALUES = -2.04 @ 144.83 , 21.67 @ 58.00



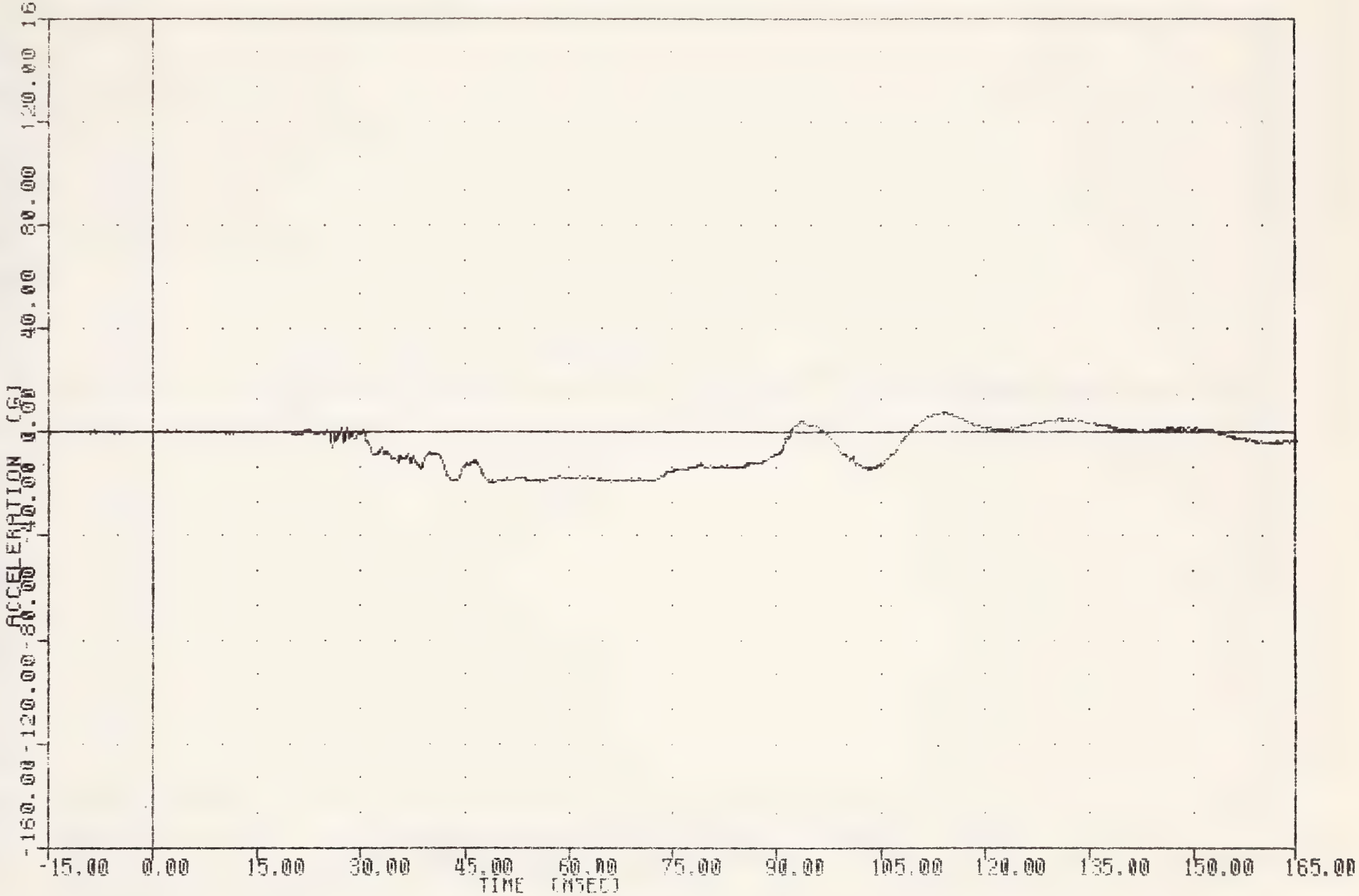
FLOOR PAN TUNNEL ACCELERATION



SLED POSITION SWITCH

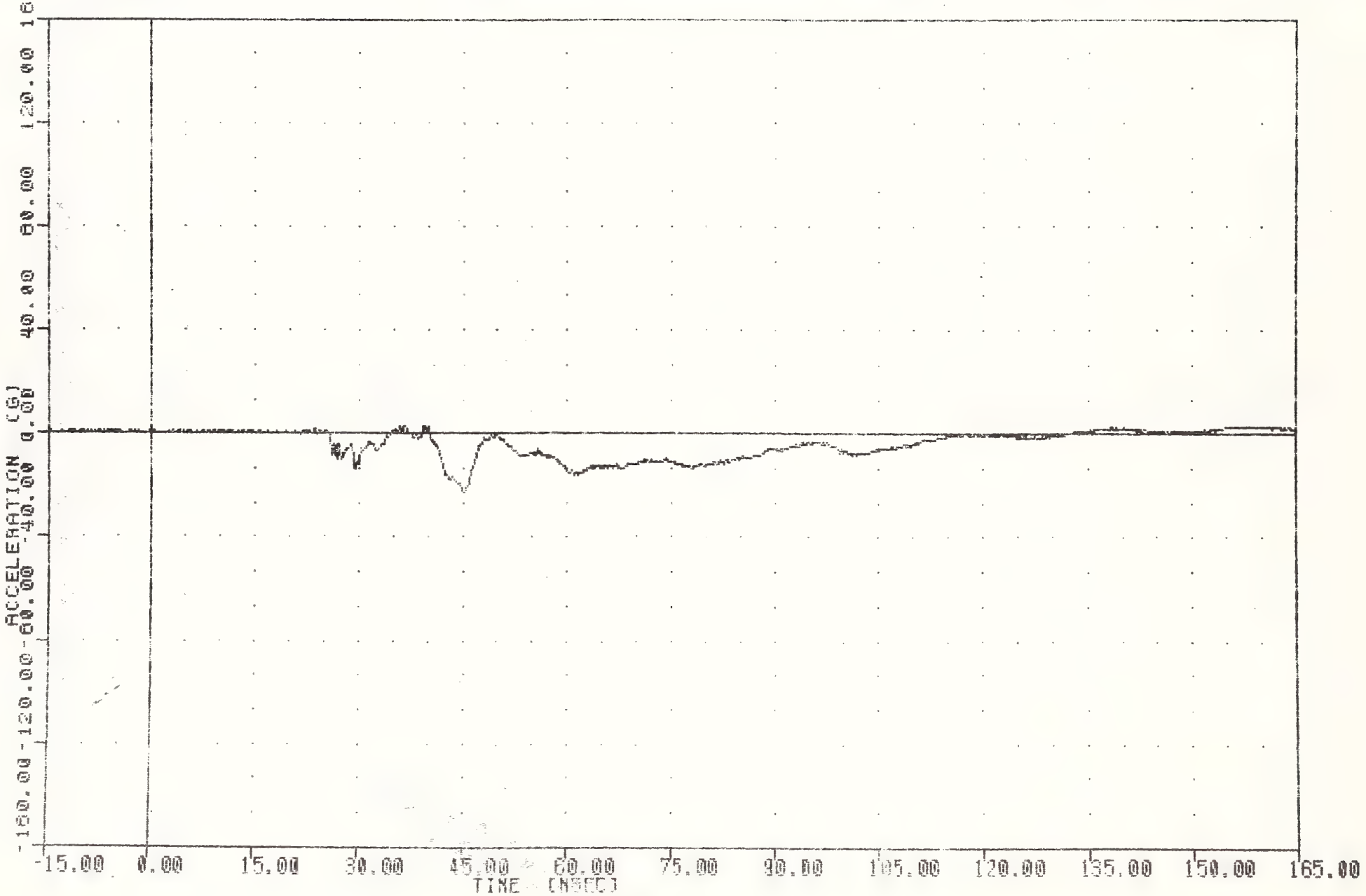
TEST NO. 10

S51100550 , TRC065 2-APR-82 14:25:06
REST. MODEL VALID. TEST
82077 FILTER = ALPF 1650/ 5214/ -40
HEDXG1 MIN, MAX VALUES = -19.66 @ 48.38 , 7.82 @ 113.13



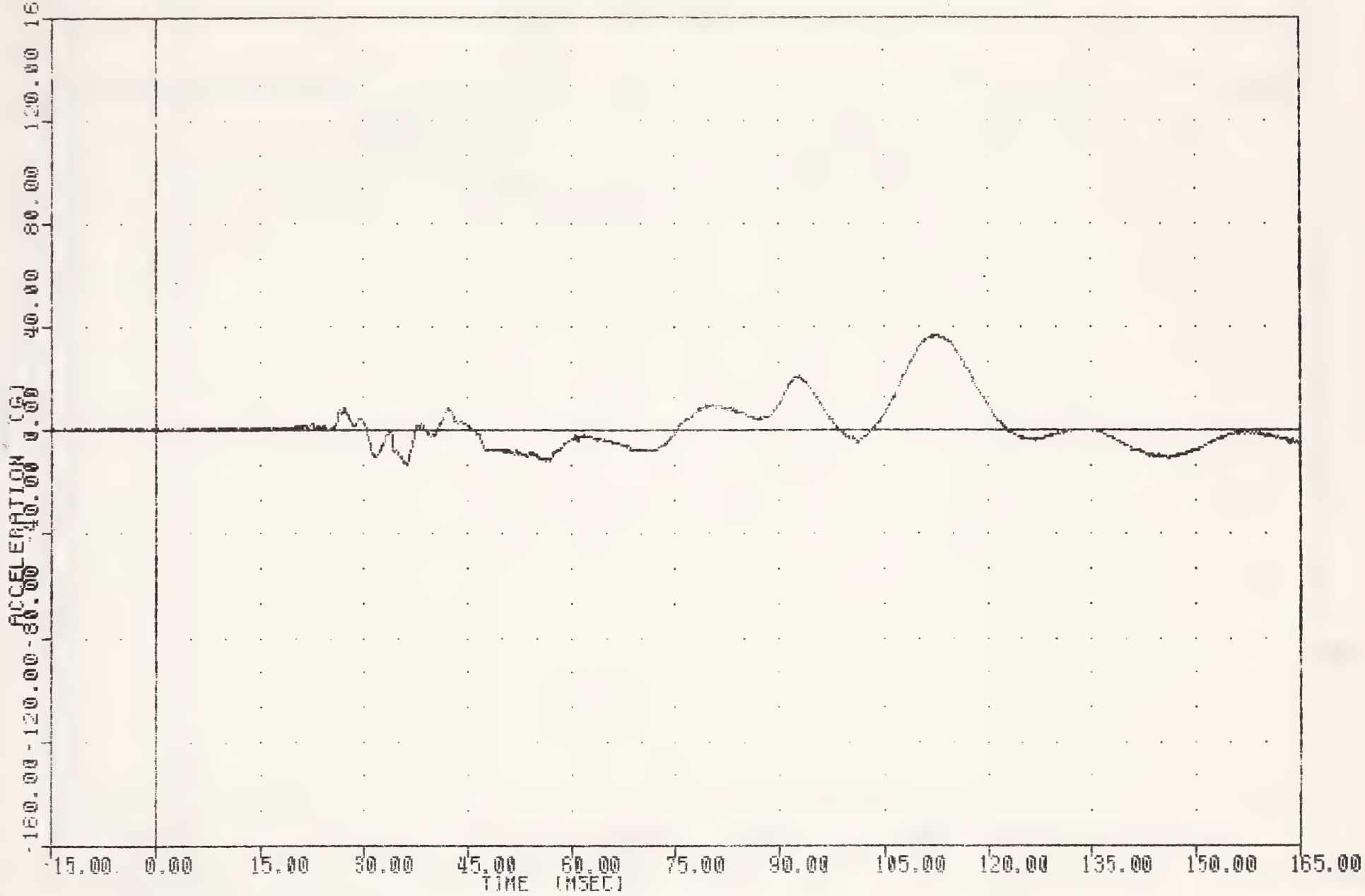
HEAD ACCELERATION X AXIS DRIVER

S51100550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = ALPF 1650/ 5214/ -40
HEDY61 MIN. MAX VALUES : -22.84 @ 44.88 , 3.16 @ 35.75



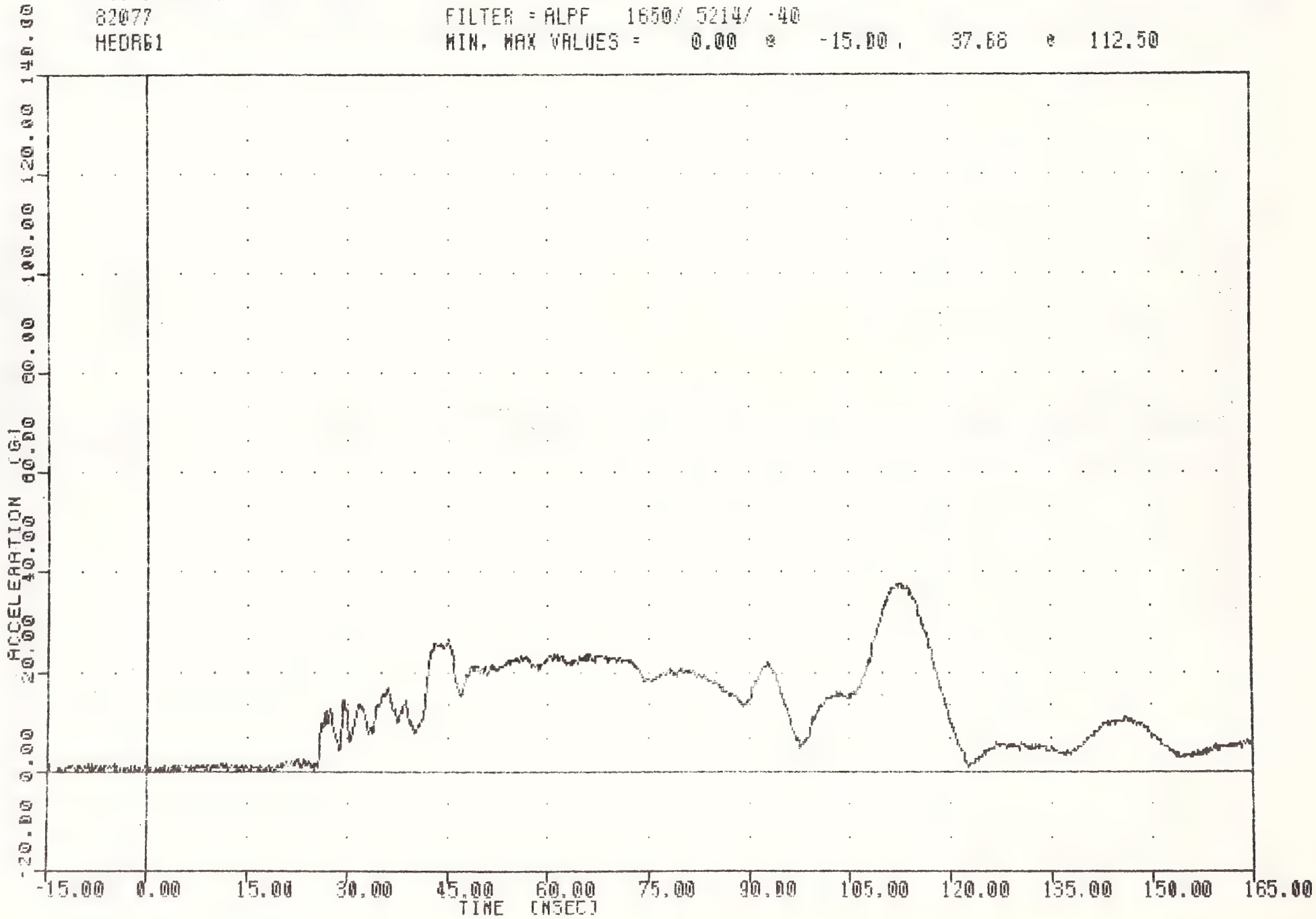
HEAD ACCELERATION Y AXIS DRIVER

S51100550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = ALPF 1650/ 5214/ -40
HEDZG1 MIN, MAX VALUES = -13.29 @ 36.00 , 36.94 @ 111.88

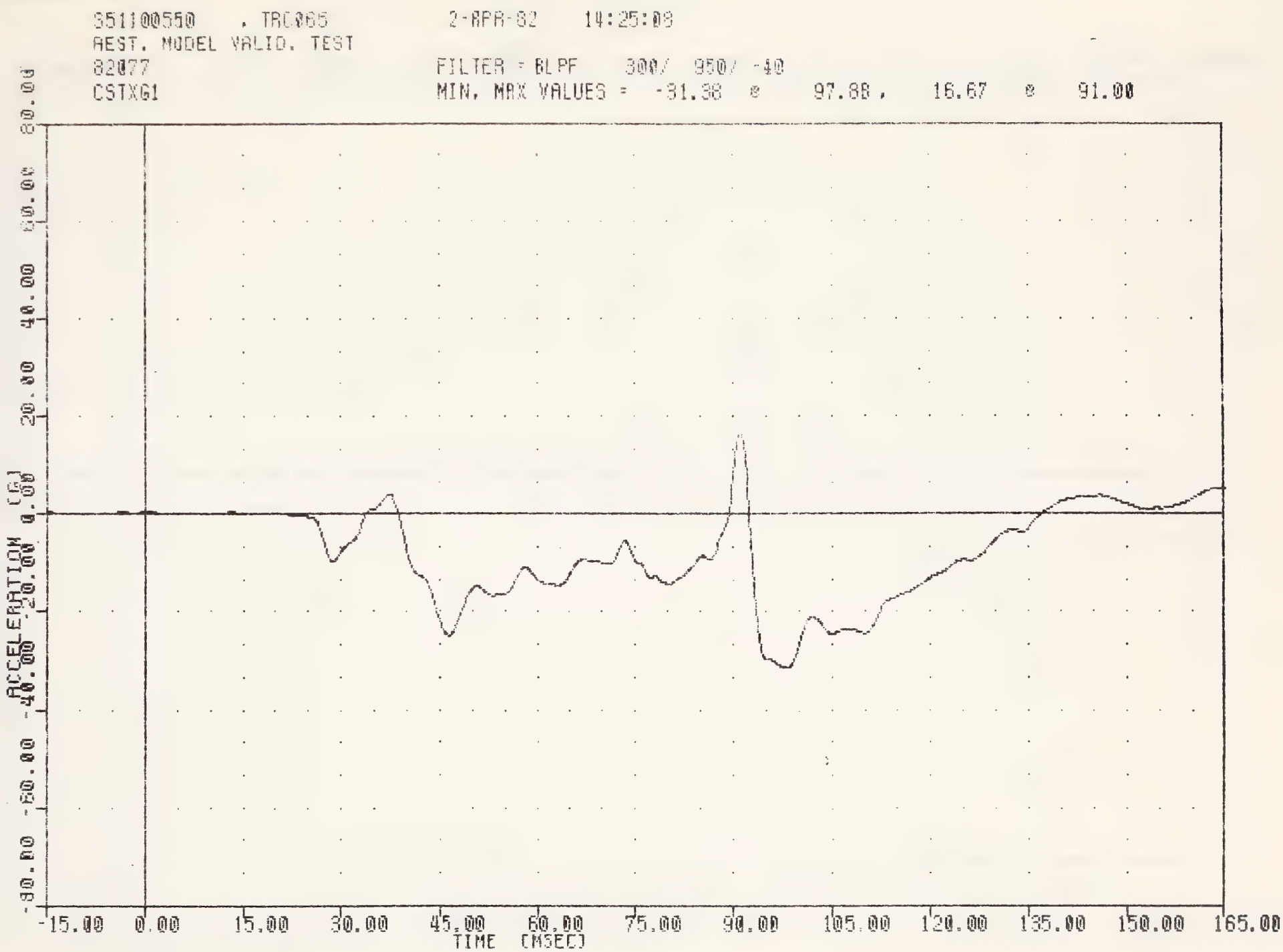


HEAD ACCELERATION Z AXIS DRIVER

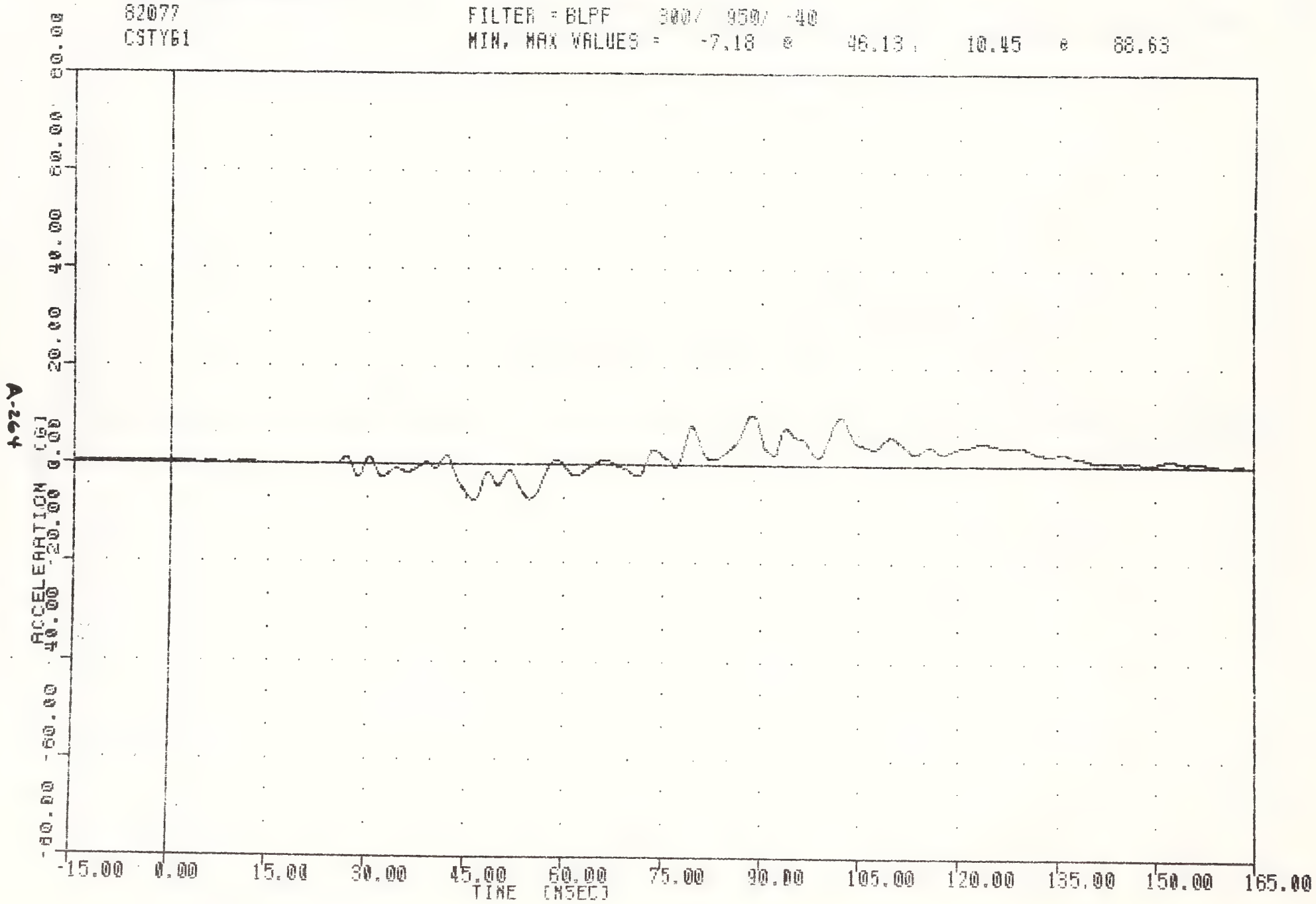
S511D0550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = ALPF 1650/ 5214/ -40
HEDR61 MIN. MAX VALUES = 0.00 @ -15.00 , 37.88 @ 112.50



HEAD ACCELERATION RESULTANT .DRIVER

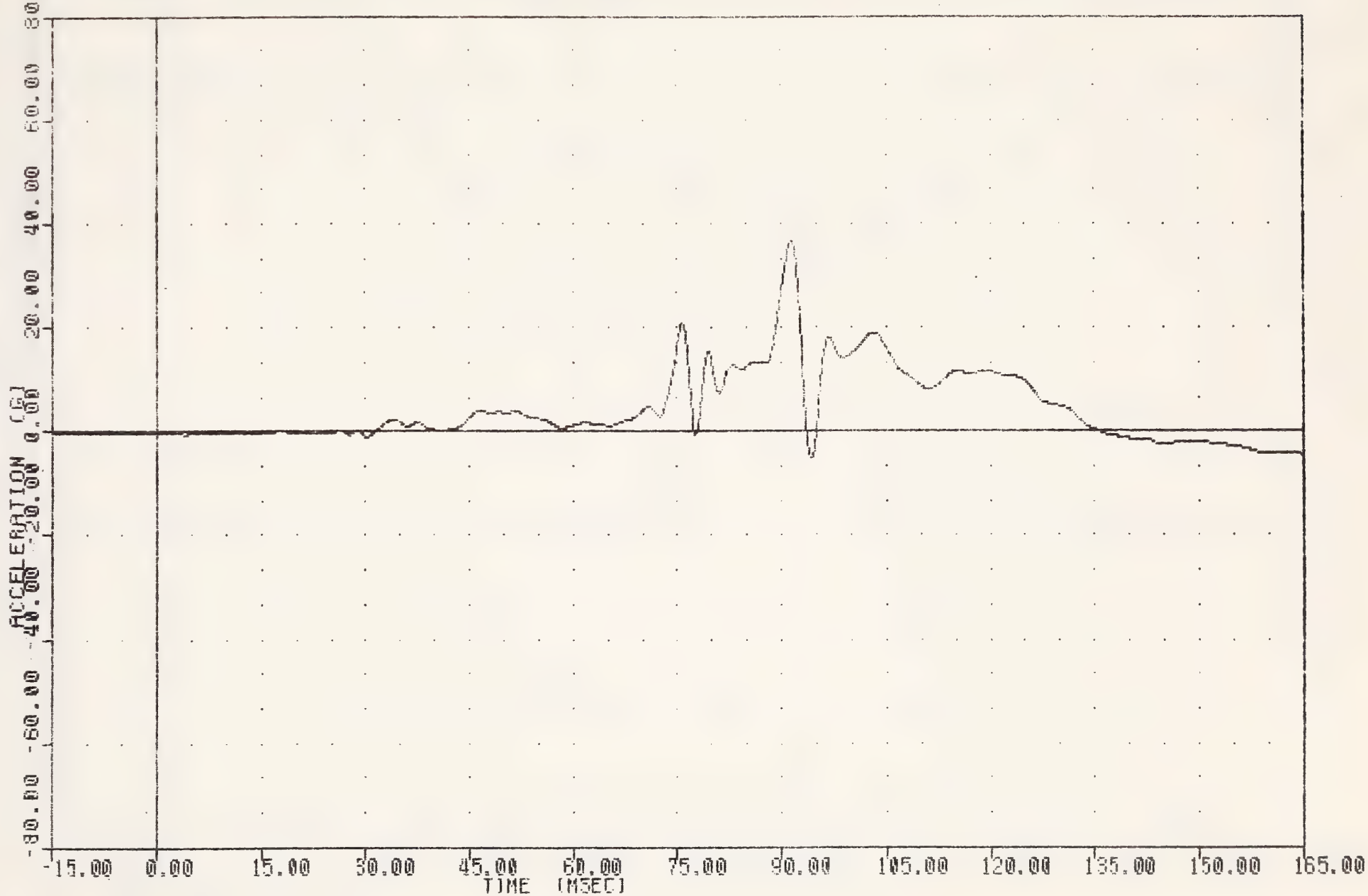


CHEST ACCELERATION X AXIS DRIVER



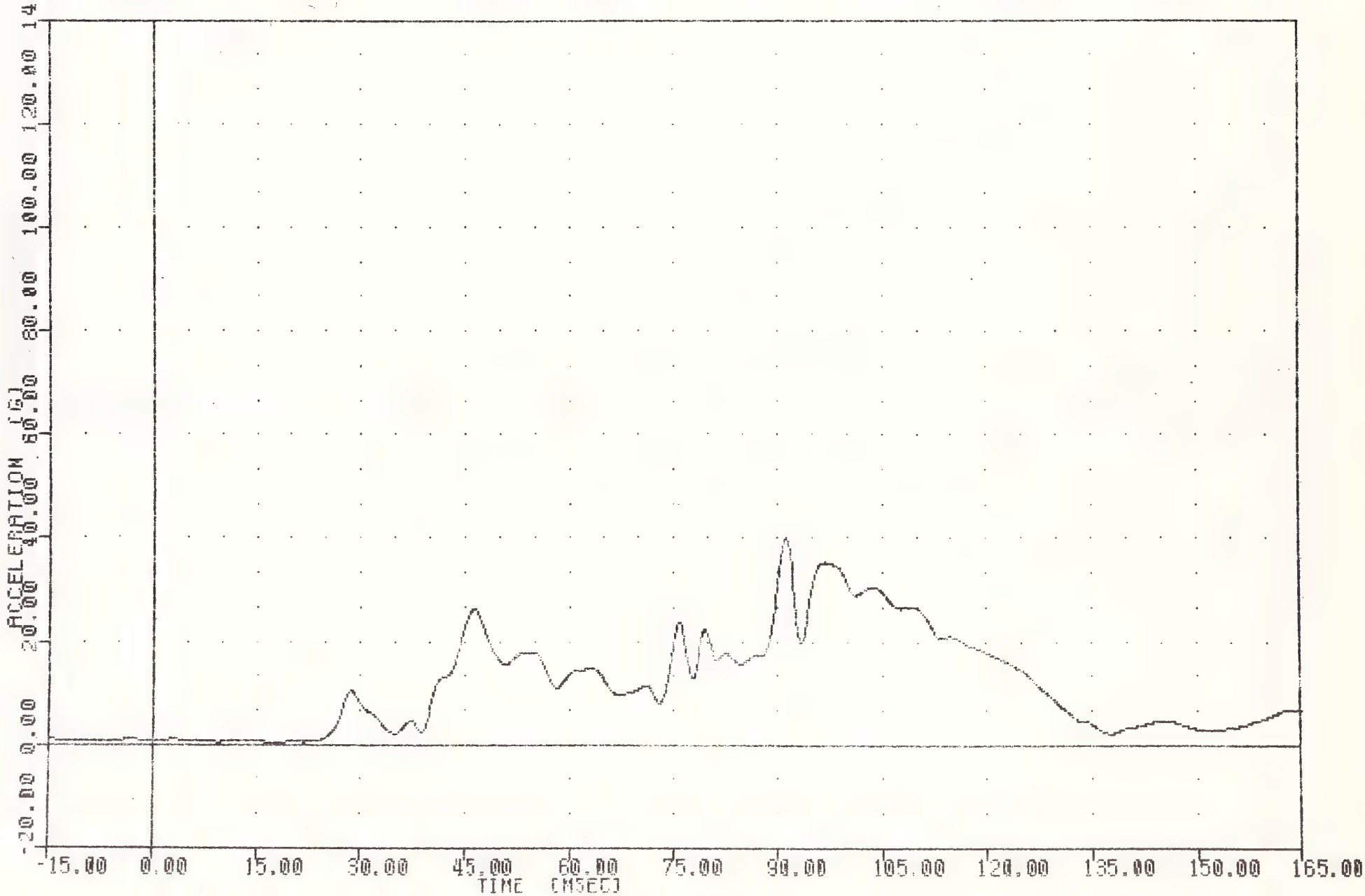
CHEST ACCELERATION Y AXIS DRIVER

S51100550 , TRC065 3-APR-82 14:25:06
AEST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
CSTZG1 MIN. MAX VALUES = -5.11 @ 94.13 , 36.69 @ 91.25



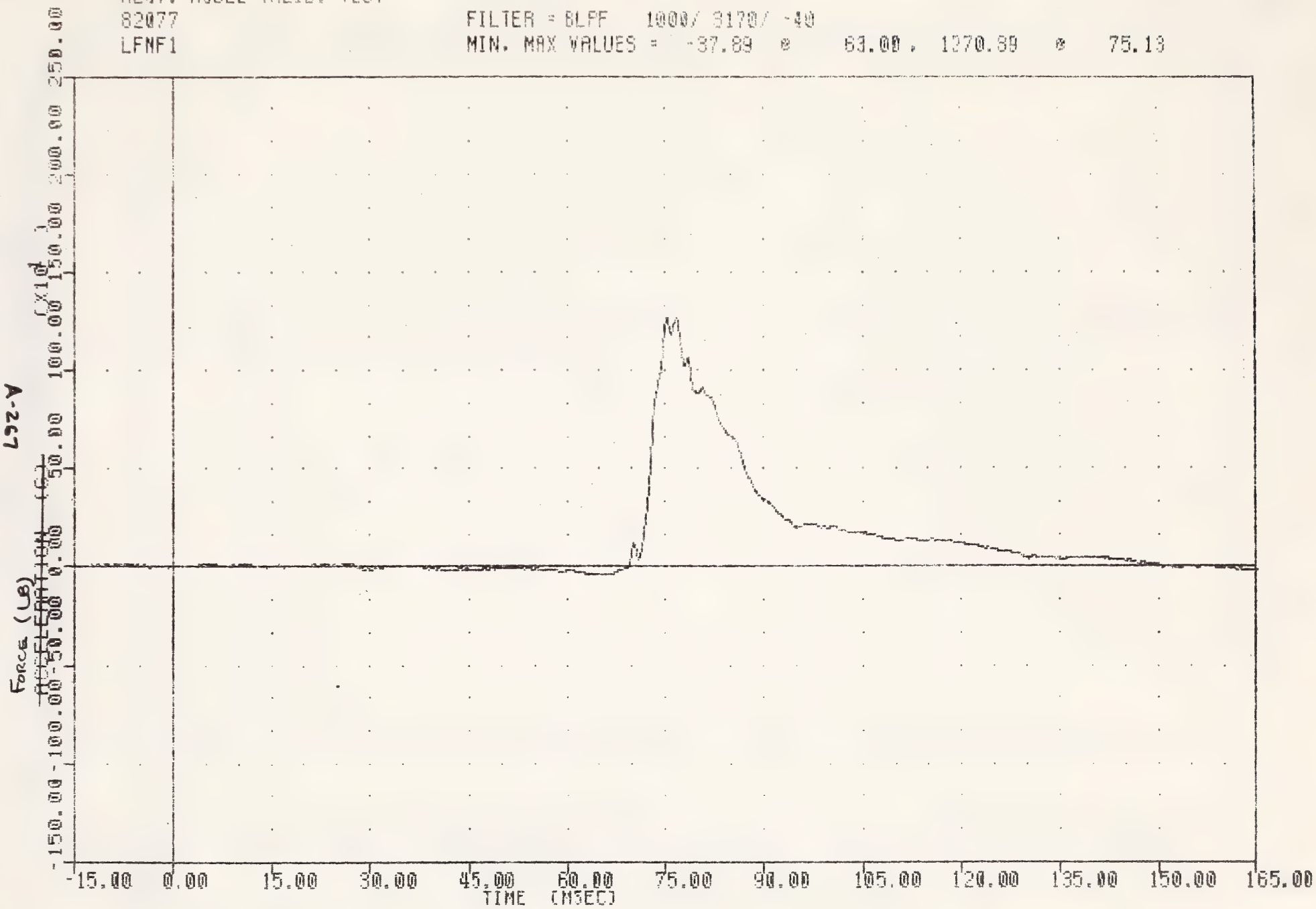
CHEST ACCELERATION Z AXIS DRIVER

S51100550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
CSTRG1 MIN, MAX VALUES = 0.42 @ 18.13 , 40.00 @ 91.13



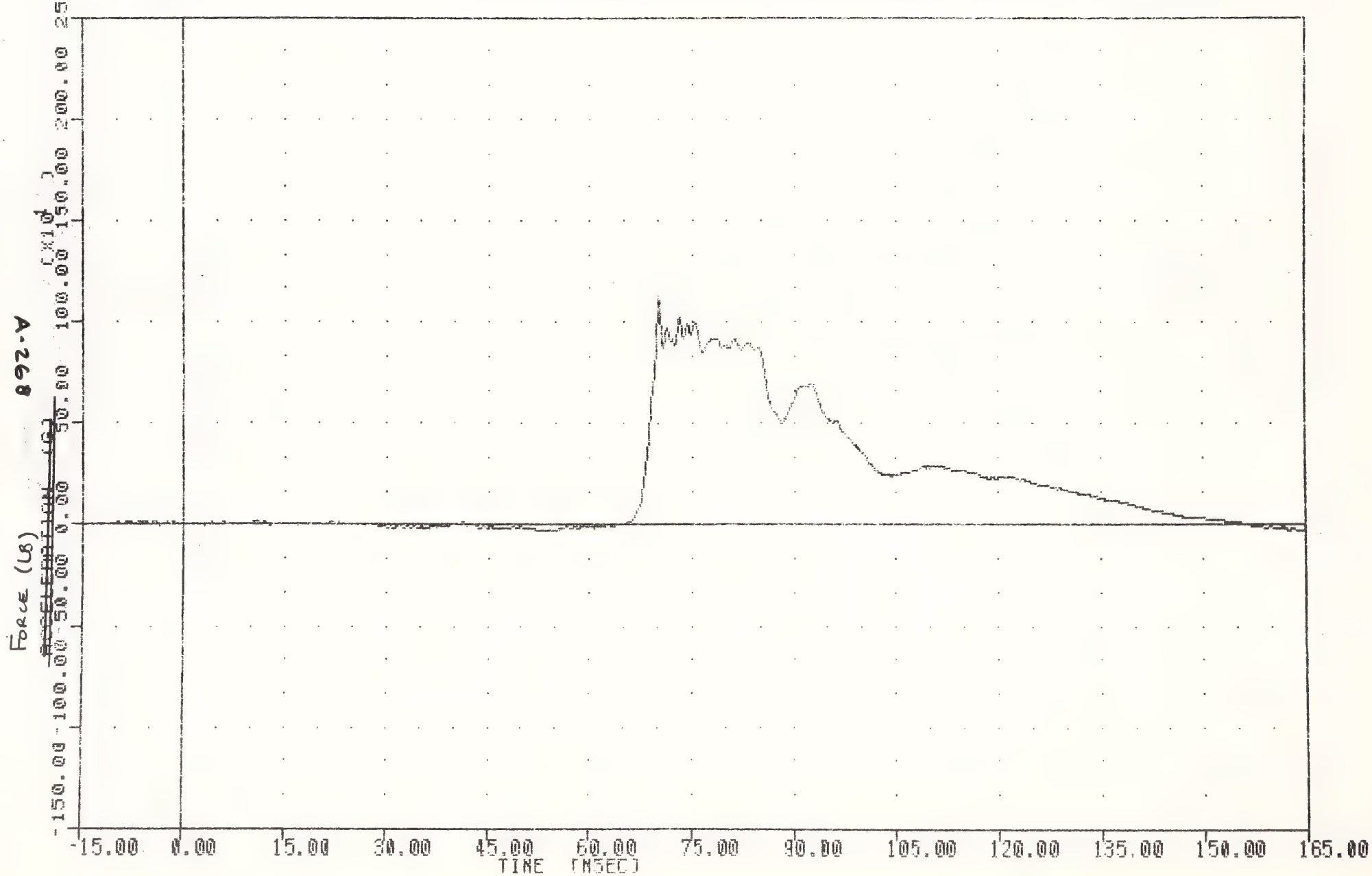
CHEST ACCELERATION RESULTANT DRIVER

S51100550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 1000/ 3170/ -40
LFNF1 MIN. MAX VALUES = -37.89 @ 63.00 , 1270.89 @ 75.13



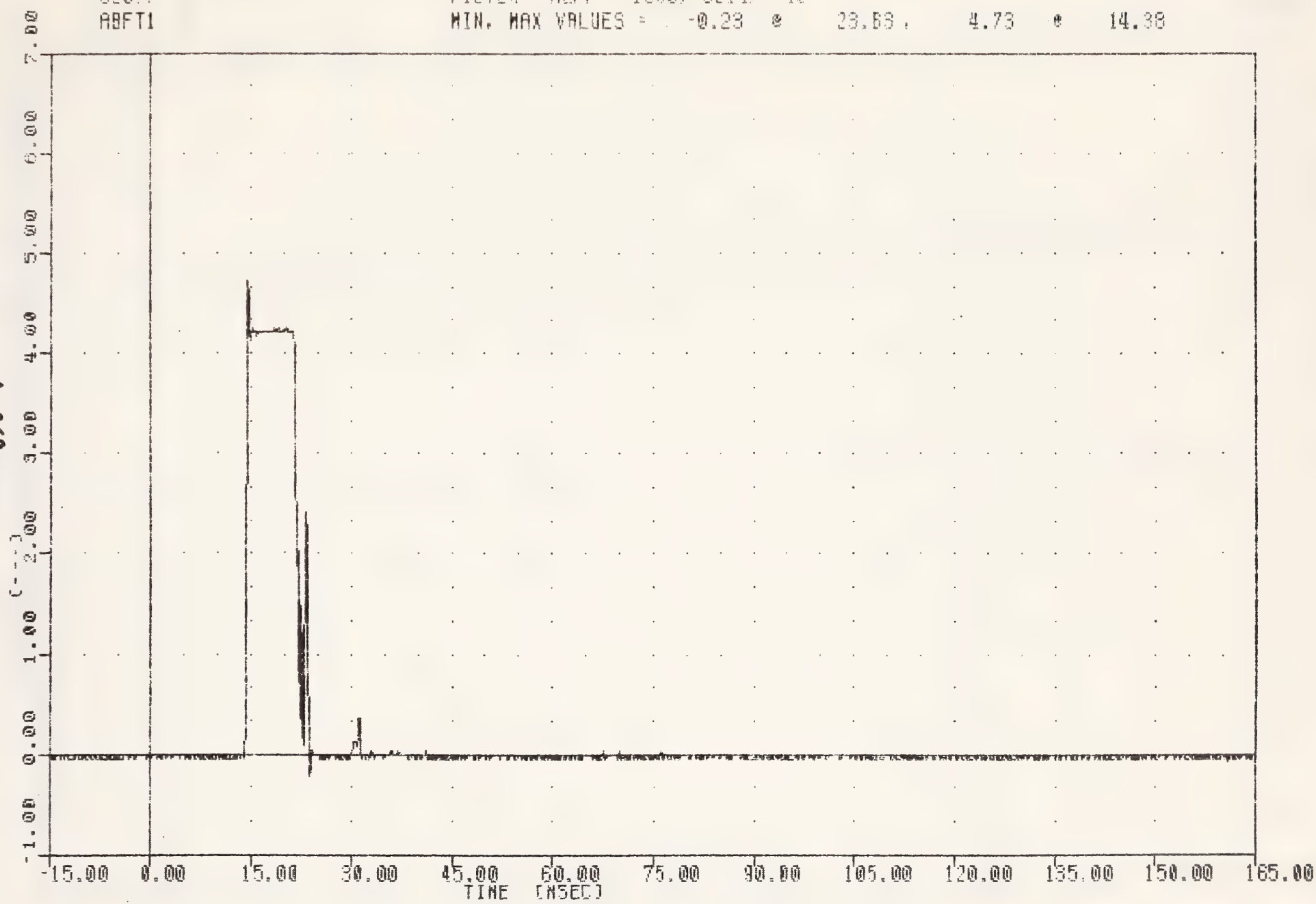
LEFT FEMUR FORCE DRIVER

S511D0550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 1000/ 3170/ -40
RFMF1 MIN. MAX VALUES = -24.76 @ 163.88 : 1132.78 @ 70.00



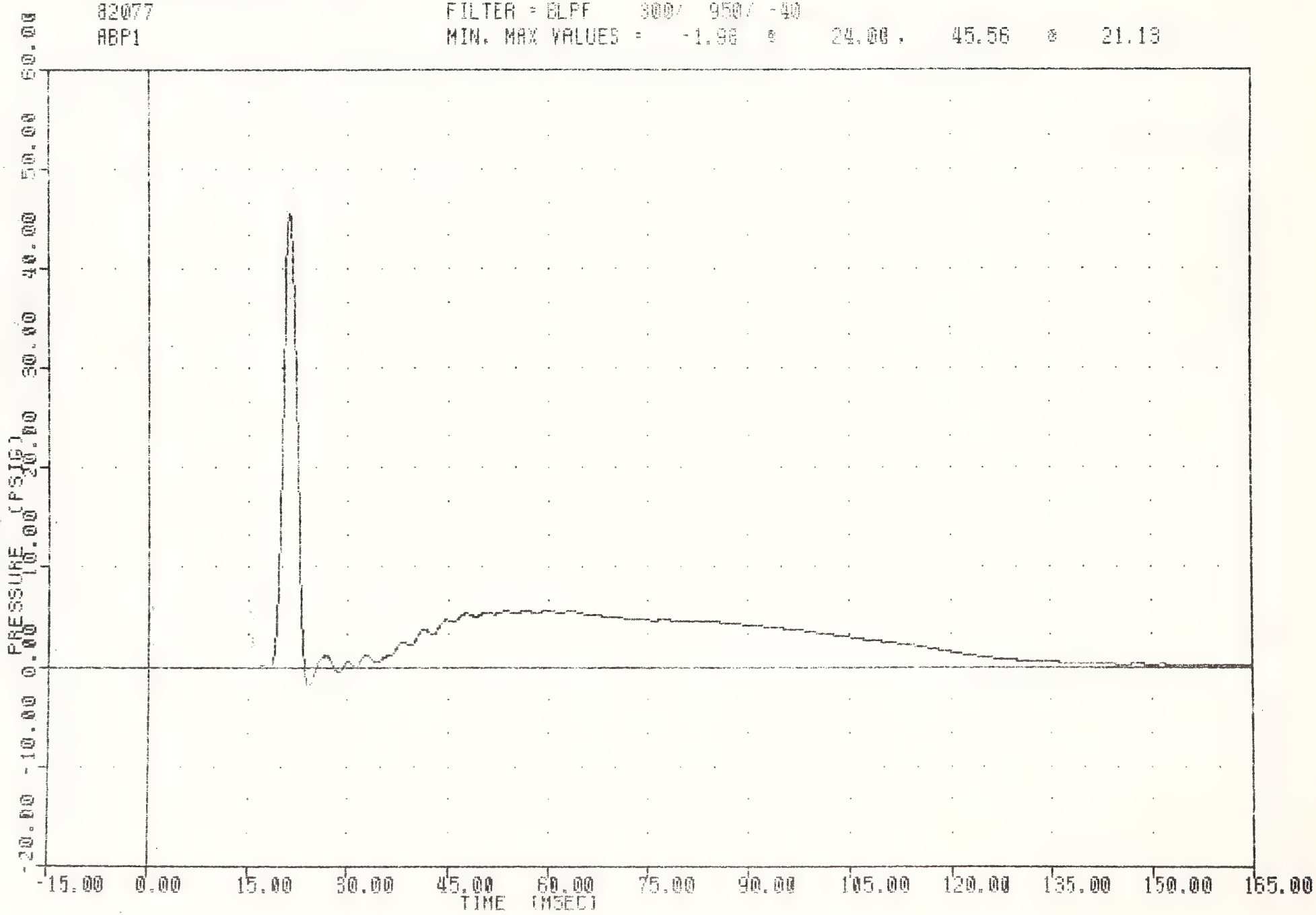
RIGHT FEMUR FORCE DRIVER

A-268

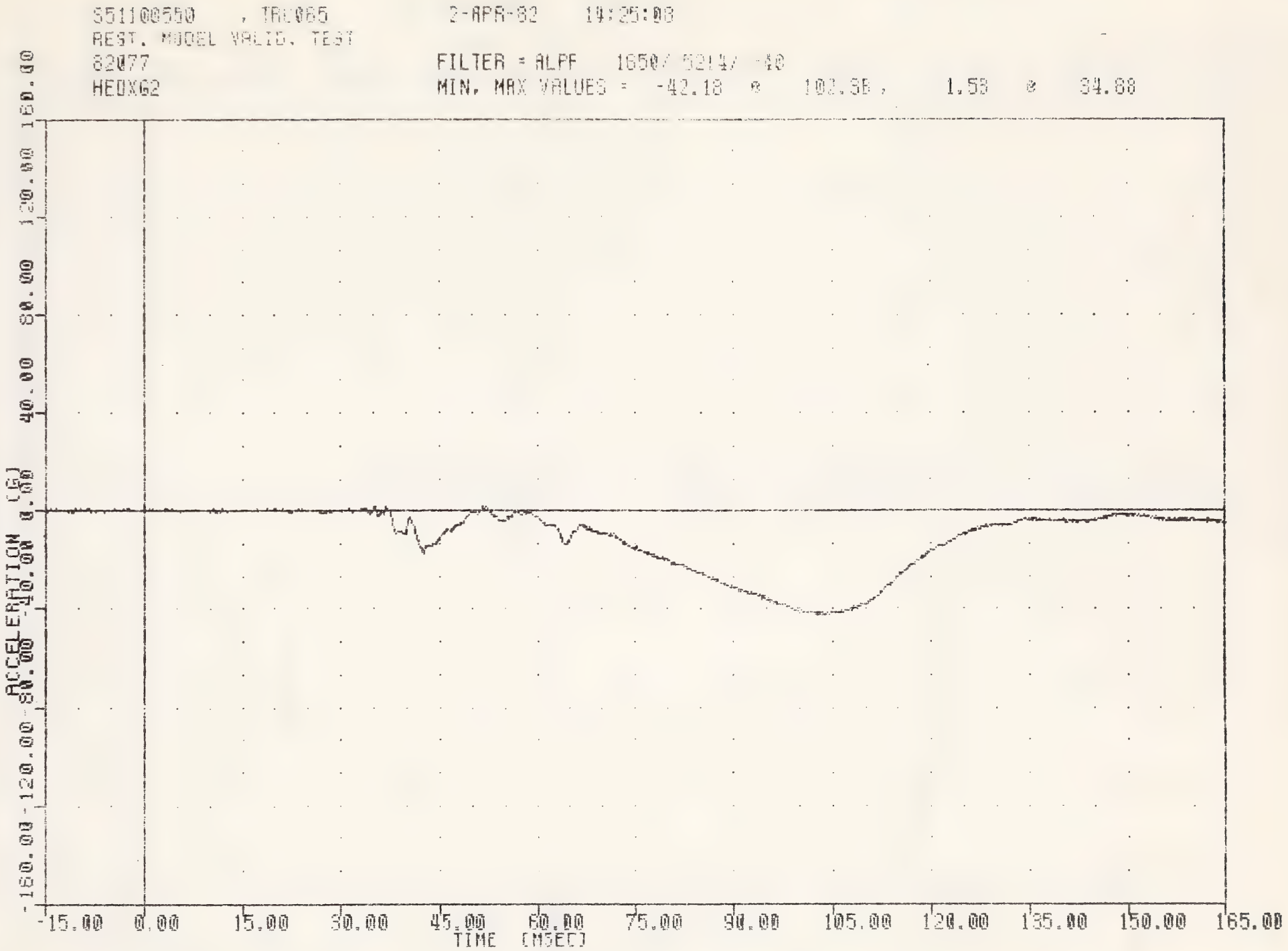


AIR BAG FIRING EVENT DRIVER

S51100550 . TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
ABP1 MIN. MAX VALUES = -1.98 @ 24.00 , 45.56 @ 21.13

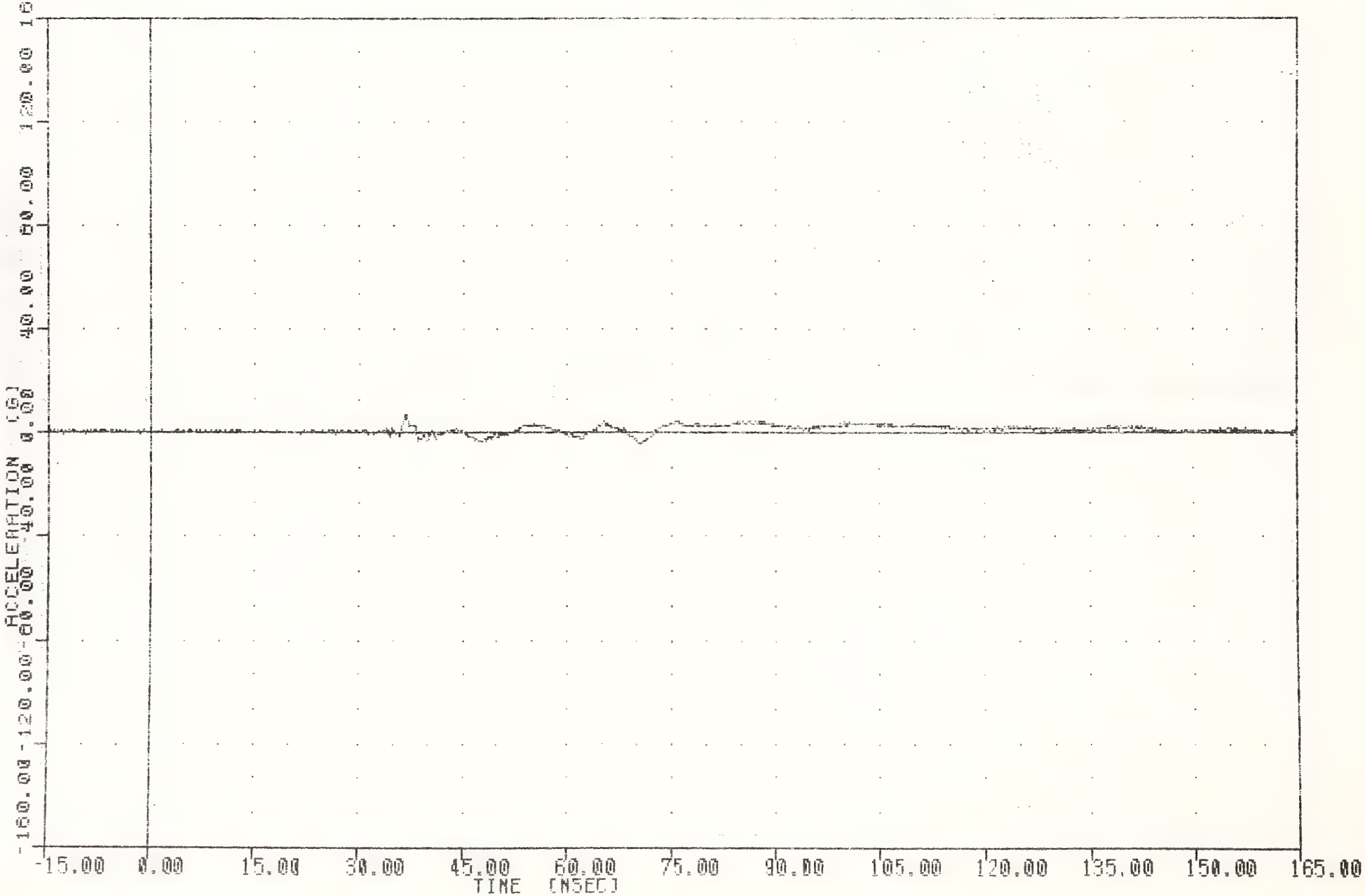


AIR BAG PRESSURE DRIVER

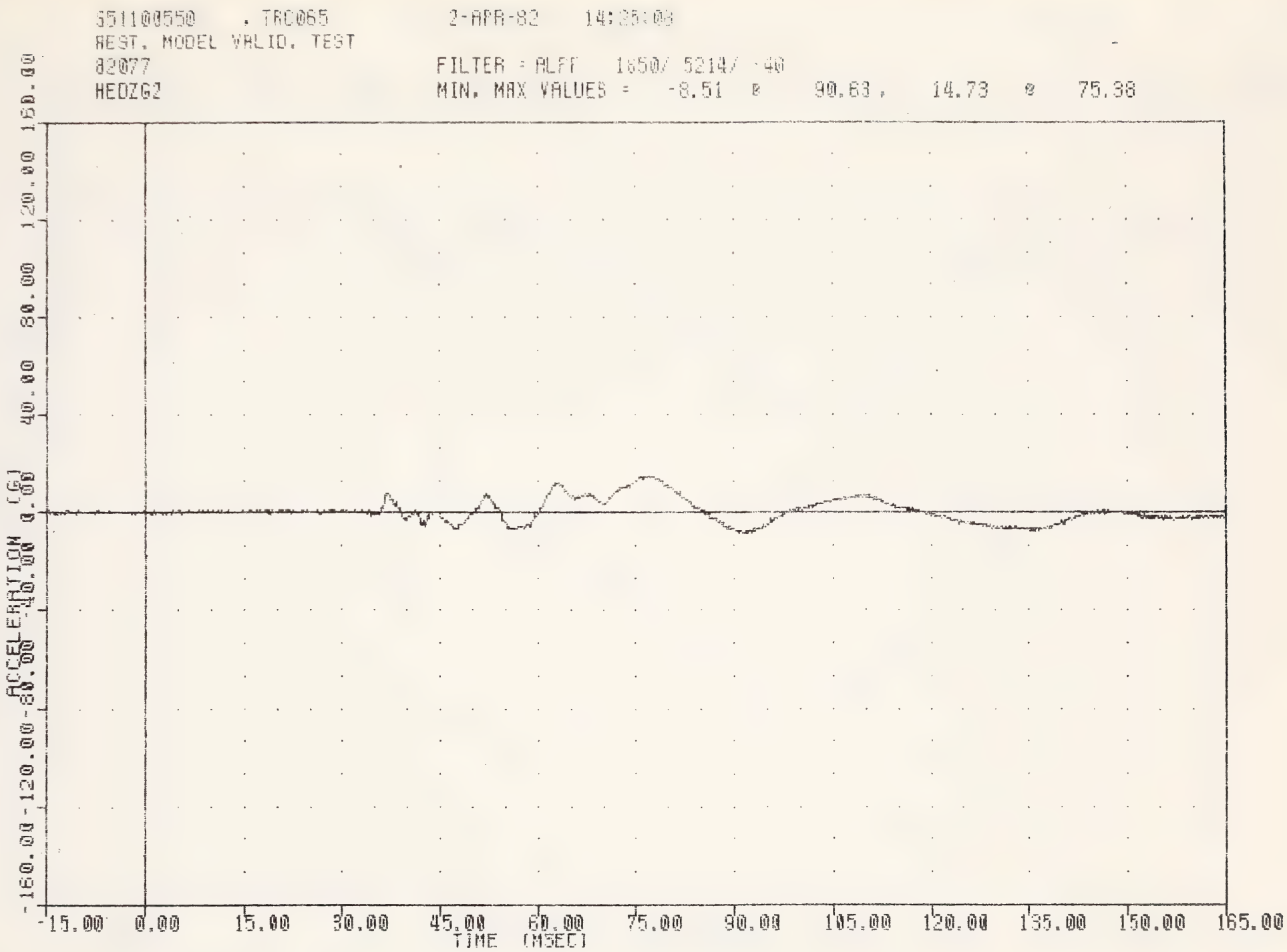


HEAD ACCELERATION X AXIS PASSENGER

S51100650 , TAC065 2-APR-82 14:25:06
REST. MODEL VALID. TEST
82077 FILTER = ALPF 1650/ 5214/ -40
HEDY62 MIN, MAX VALUES = -3.94 @ 70.13 , 7.14 @ 36.63

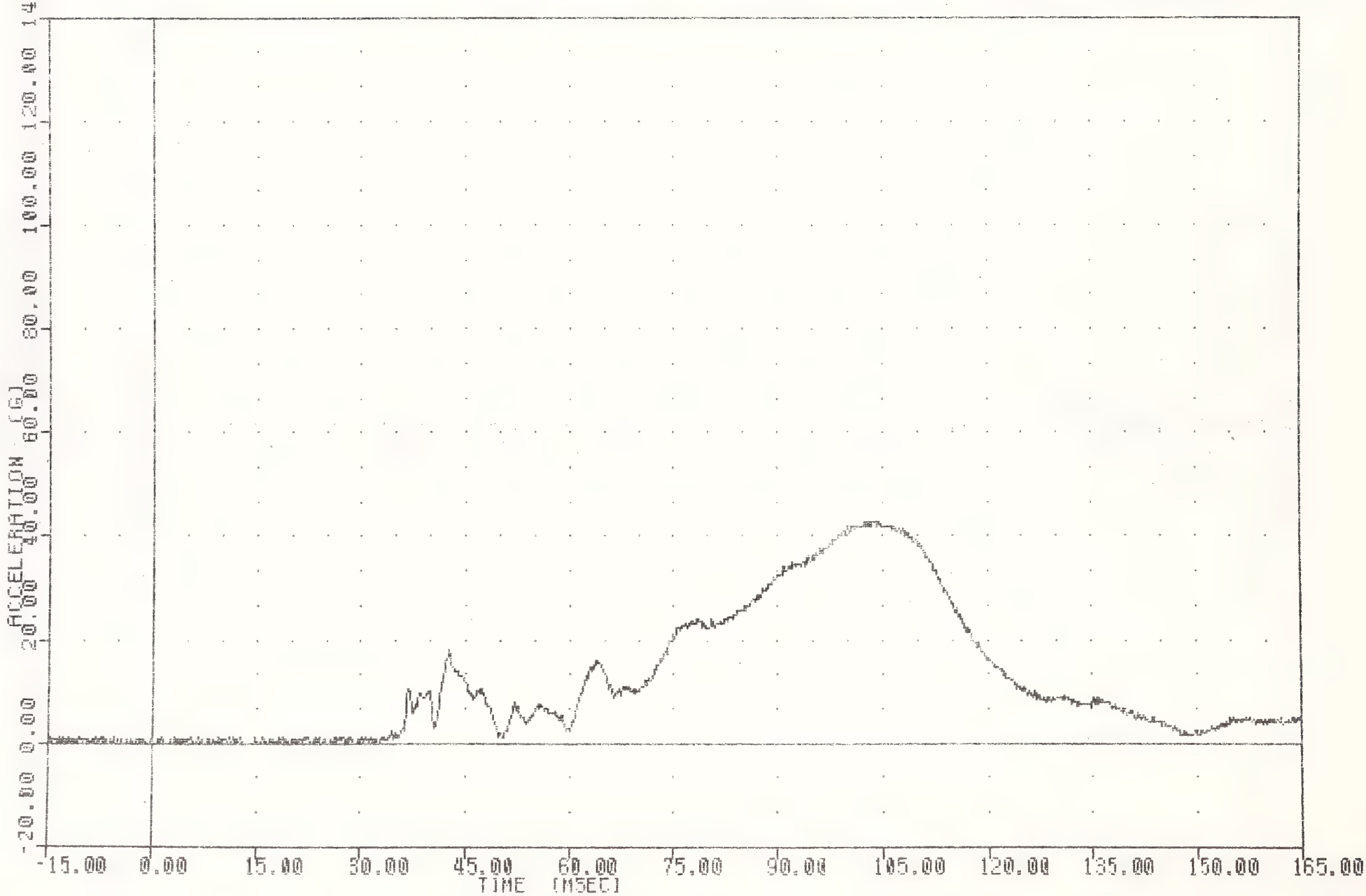


HEAD ACCELERATION Y AXIS PASSENGER



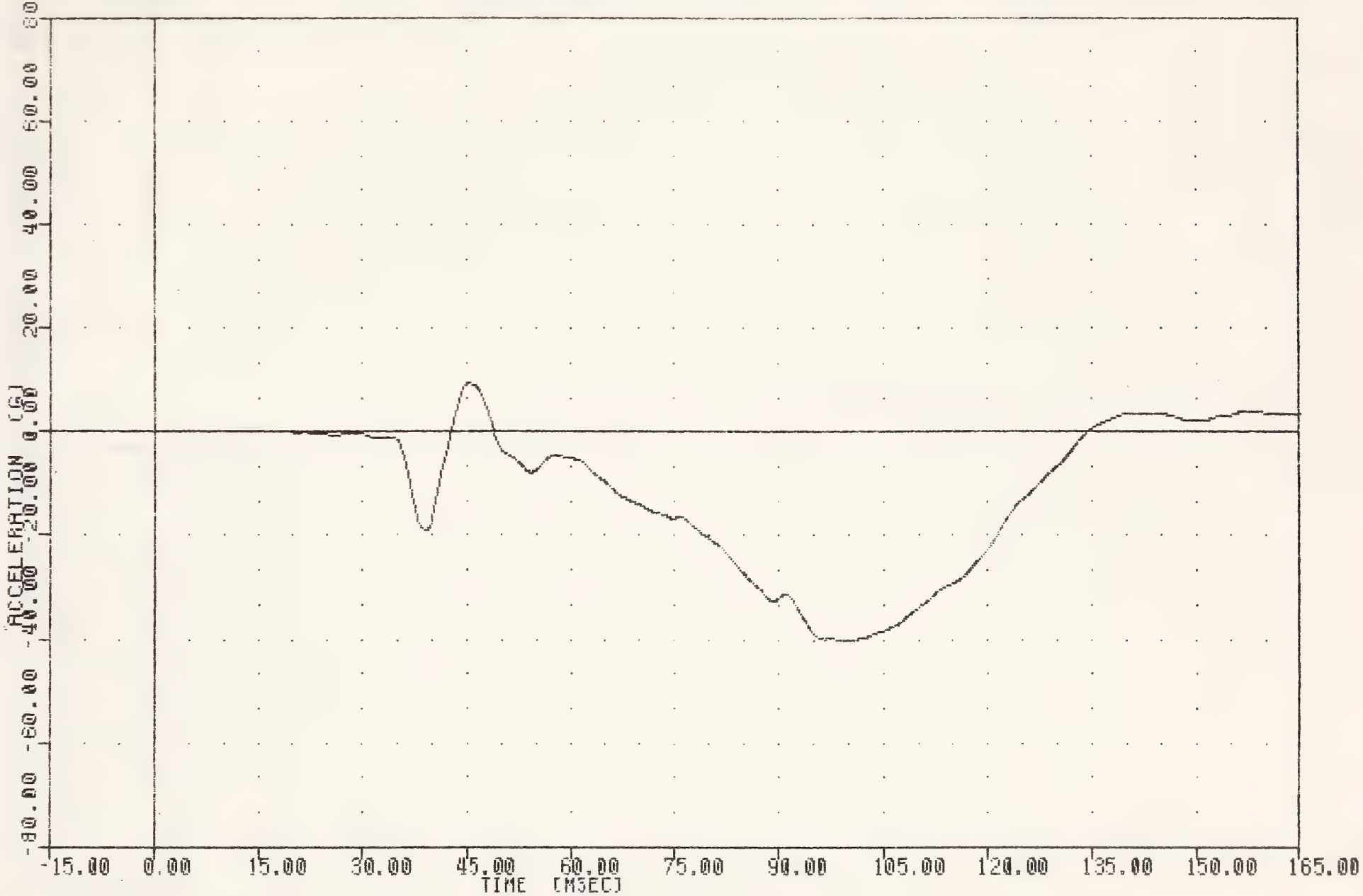
HEAD ACCELERATION Z AXIS PASSENGER

551100550 , TRC065 2-APR-82 14:25:08
BEST. MODEL VALID. TEST
82077 FILTER = ALPF 1650/ 5214/ -40
HEDRG2 MIN. MAX VALUES = 0.00 @ -15.00 , 42.62 @ 103.50



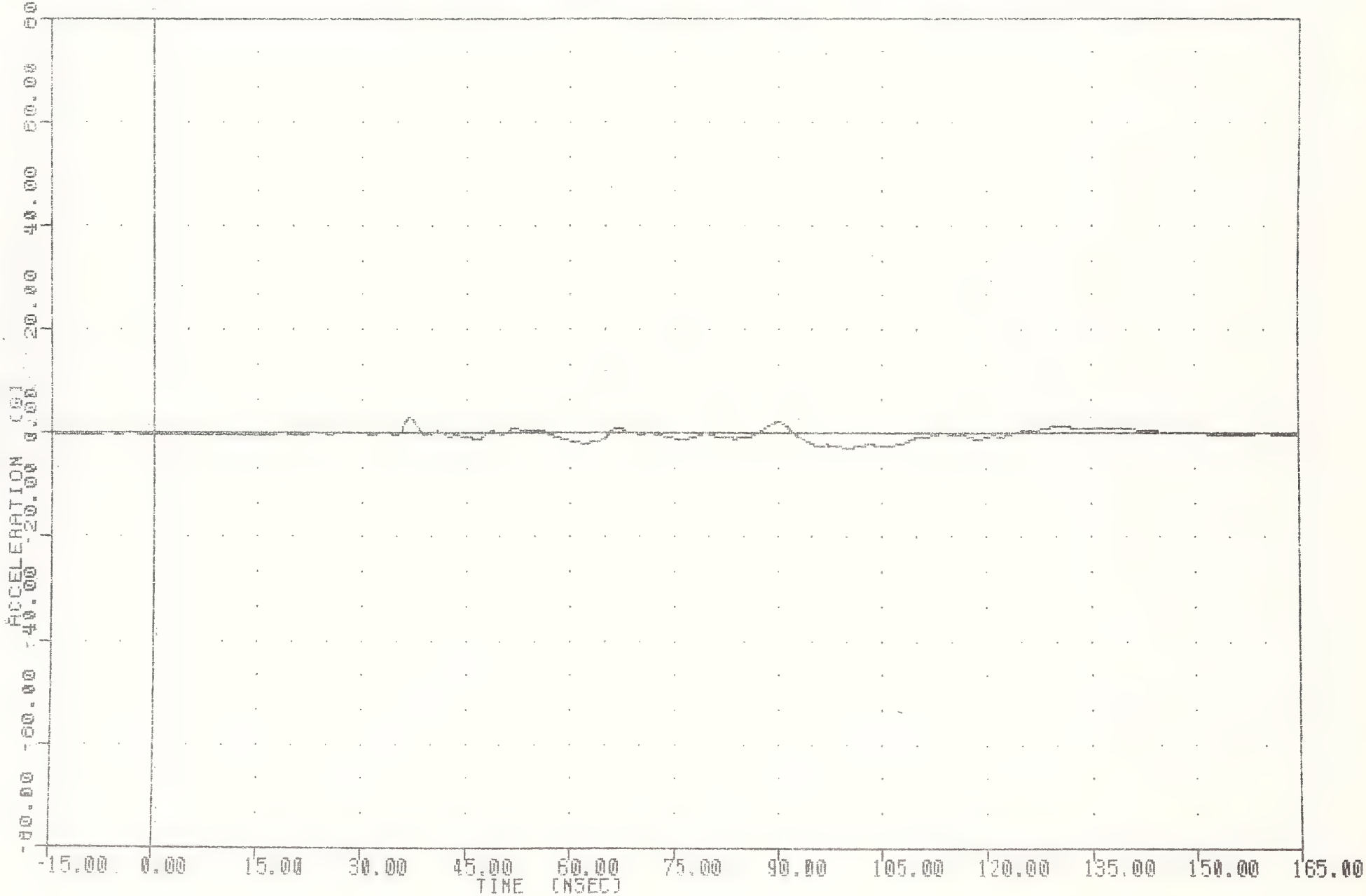
HEAD ACCELERATION RESULTANT PASSENGER

S51100550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
CSTXG2 MIN. MAX VALUES = -40.21 @ 99.00 , 9.32 @ 45.25



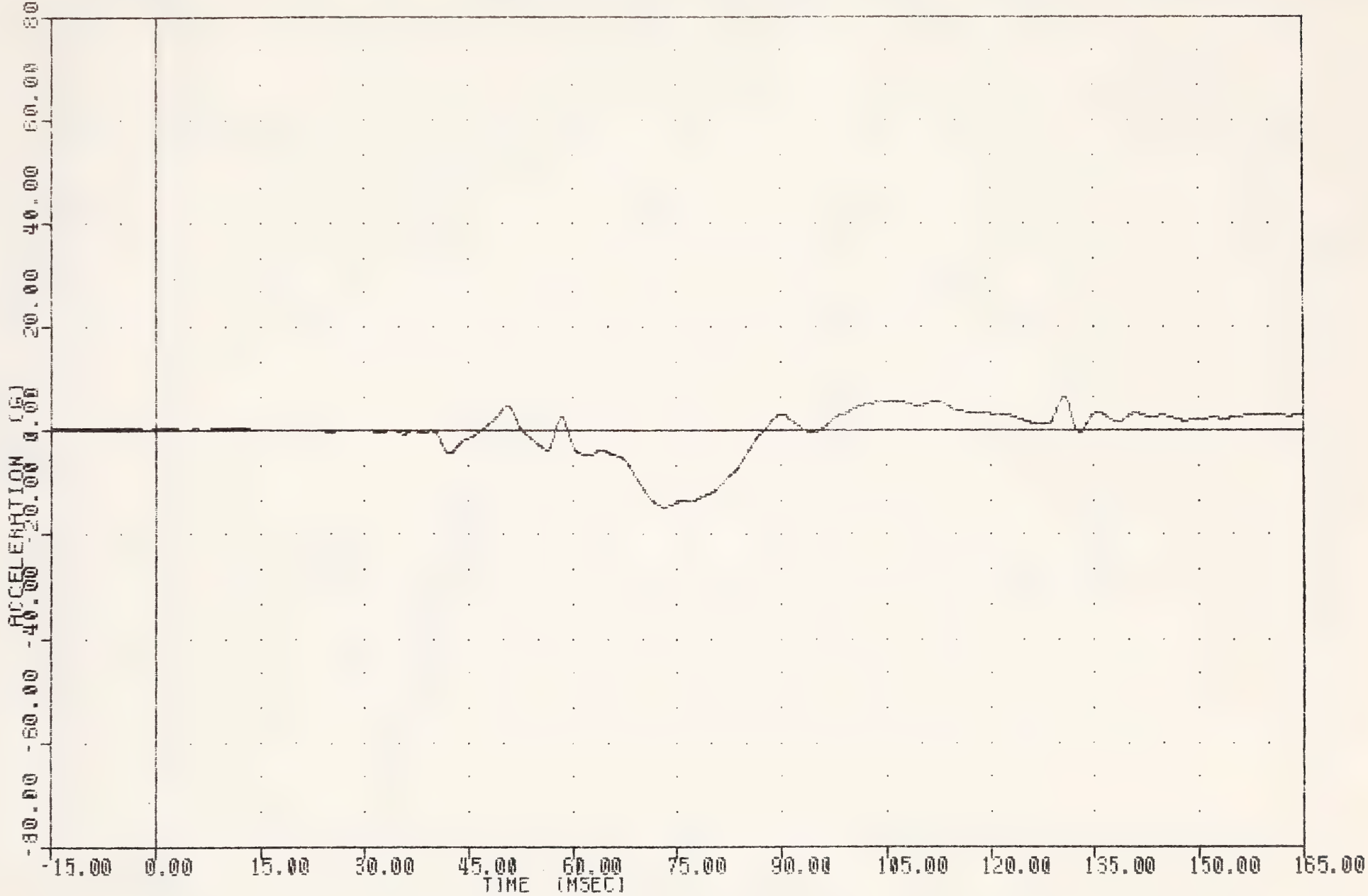
CHEST ACCELERATION X AXIS PASSENGER

551100550 , TRC065 2-APR-82 14:25:08
BEST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
CSTYG2 MIN. MAX VALUES = -2.80 @ 99.88 2.94 @ 36.75



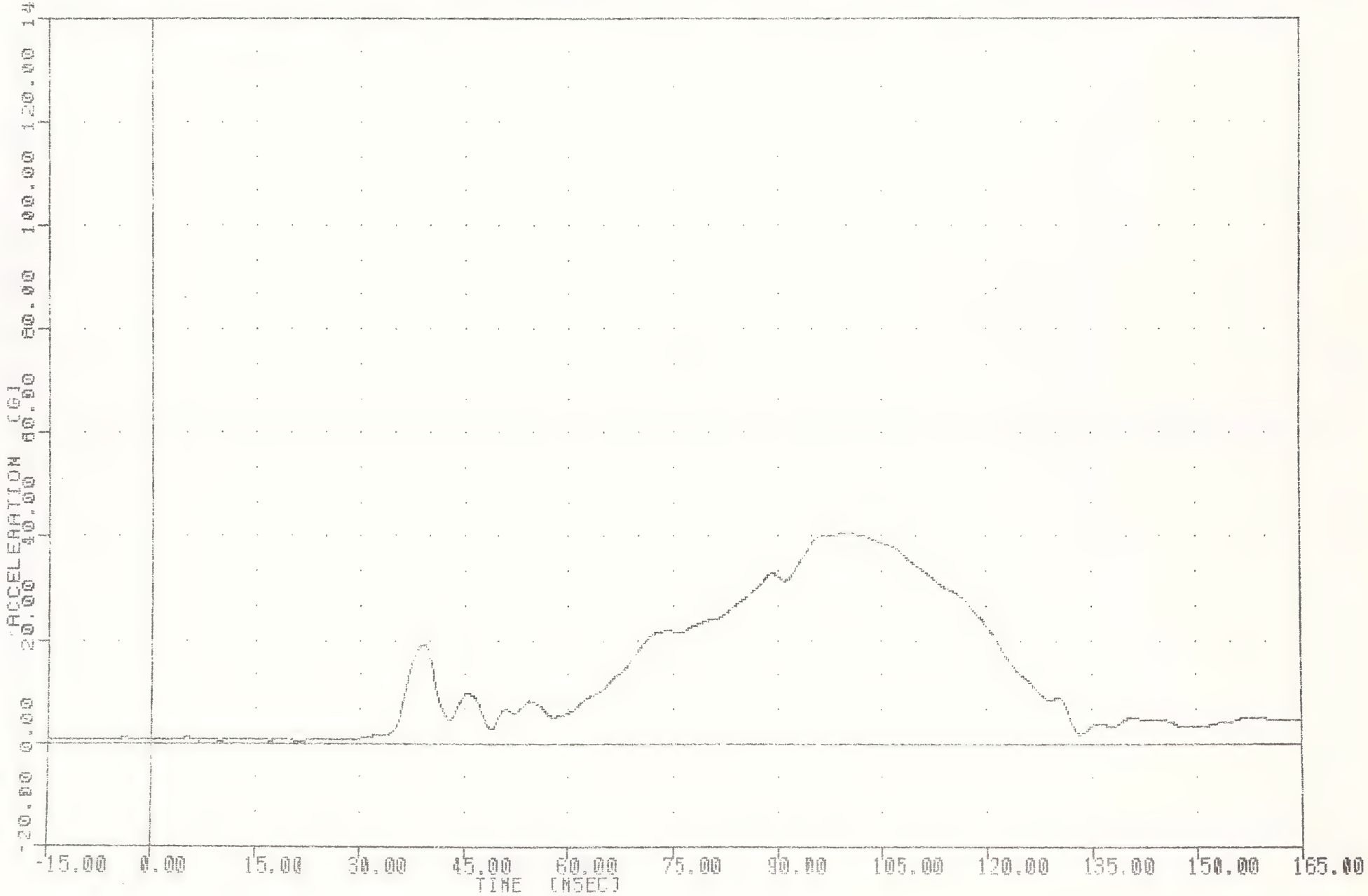
CHEST ACCELERATION Y AXIS PASSENGER

S51100550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
CSTZG2 MIN. MAX VALUES = -14.64 @ 73.00 , 6.43 @ 130.63

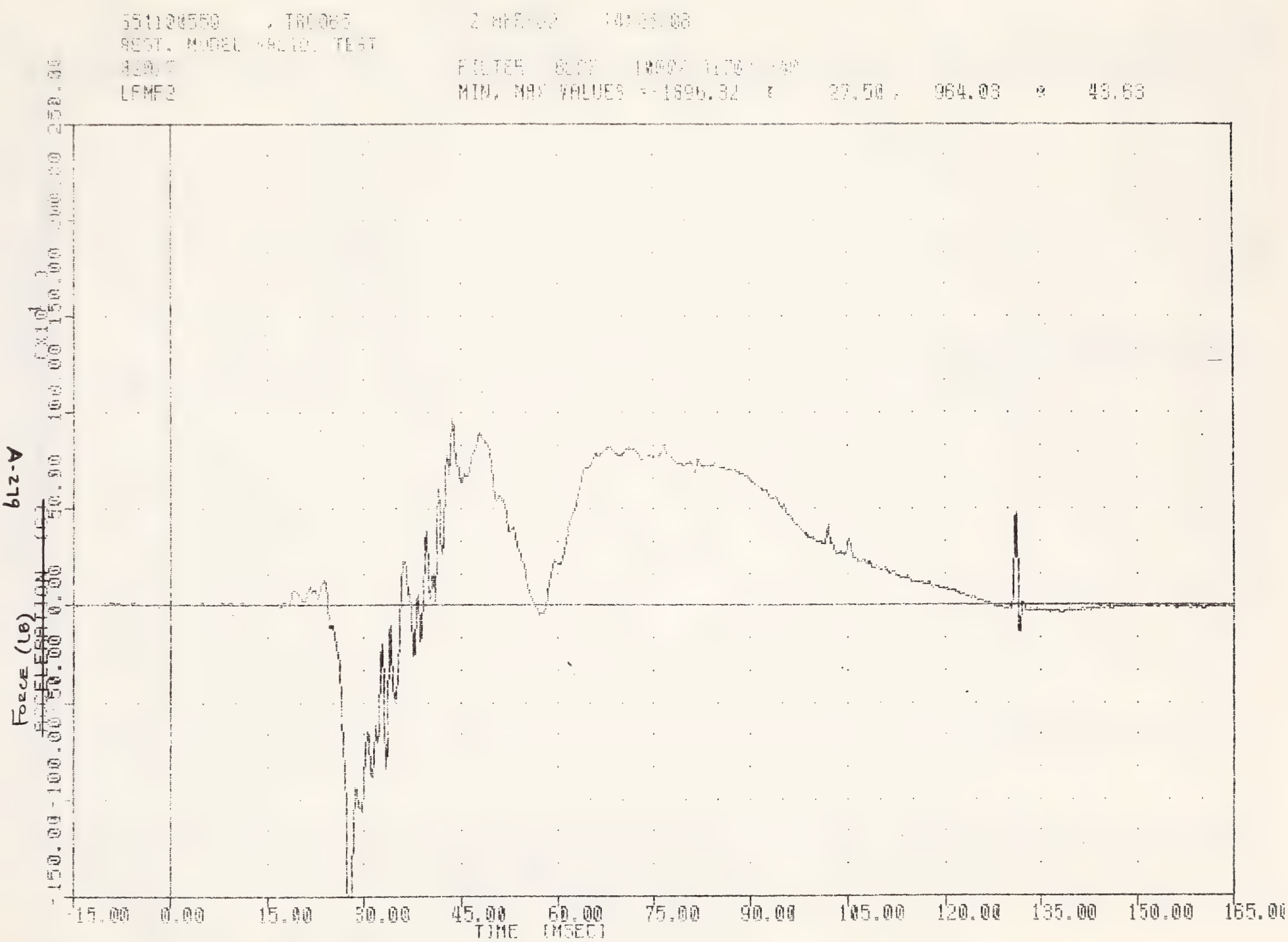


CHEST ACCELERATION Z AXIS PASSENGER

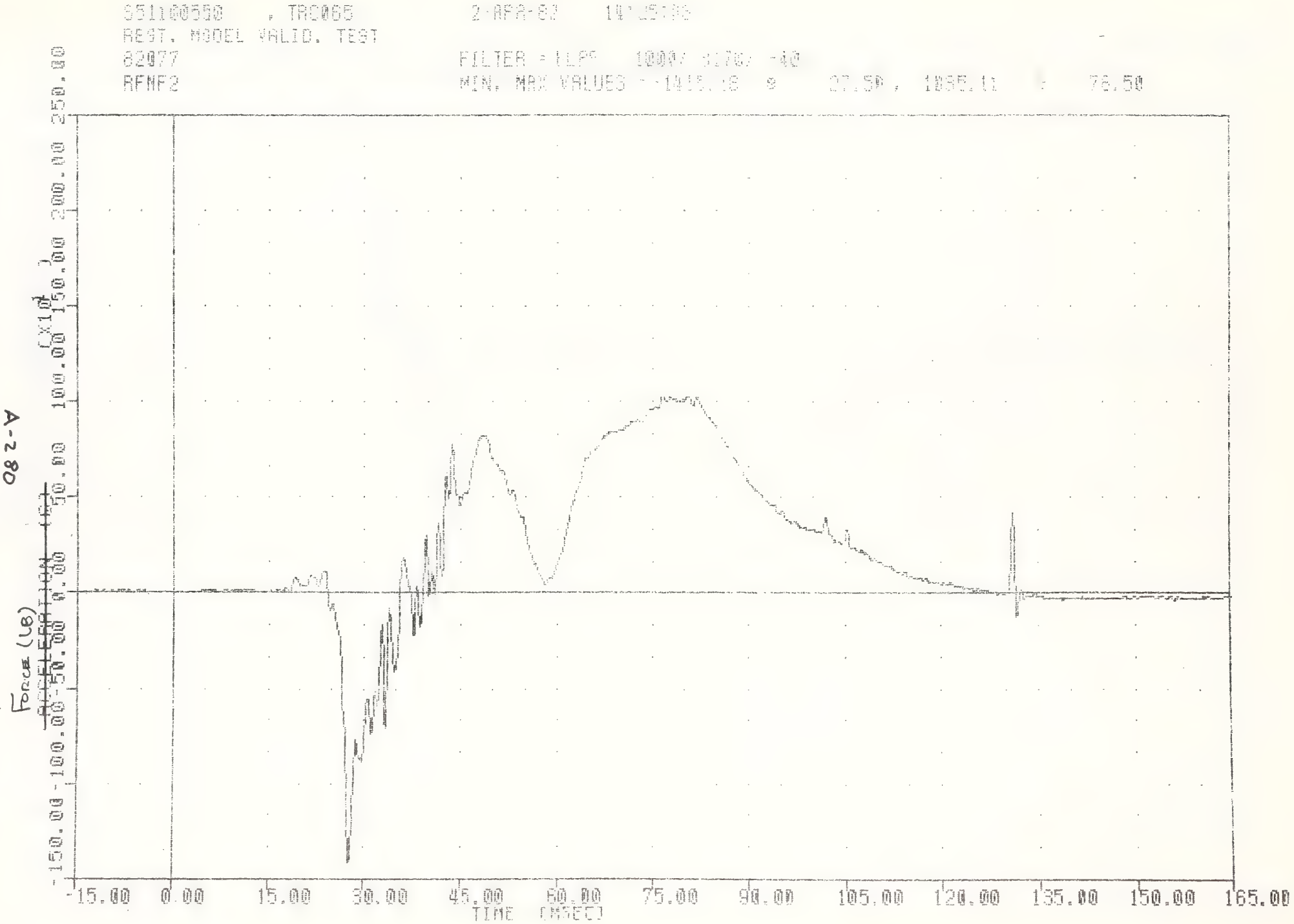
S511D0550 . TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 300/ 950/ -40
CSTRG2 MIN. MAX VALUES = 0.33 @ 21.25 , 40.47 @ 99.88



CHEST ACCELERATION RESULTANT PASSENGER

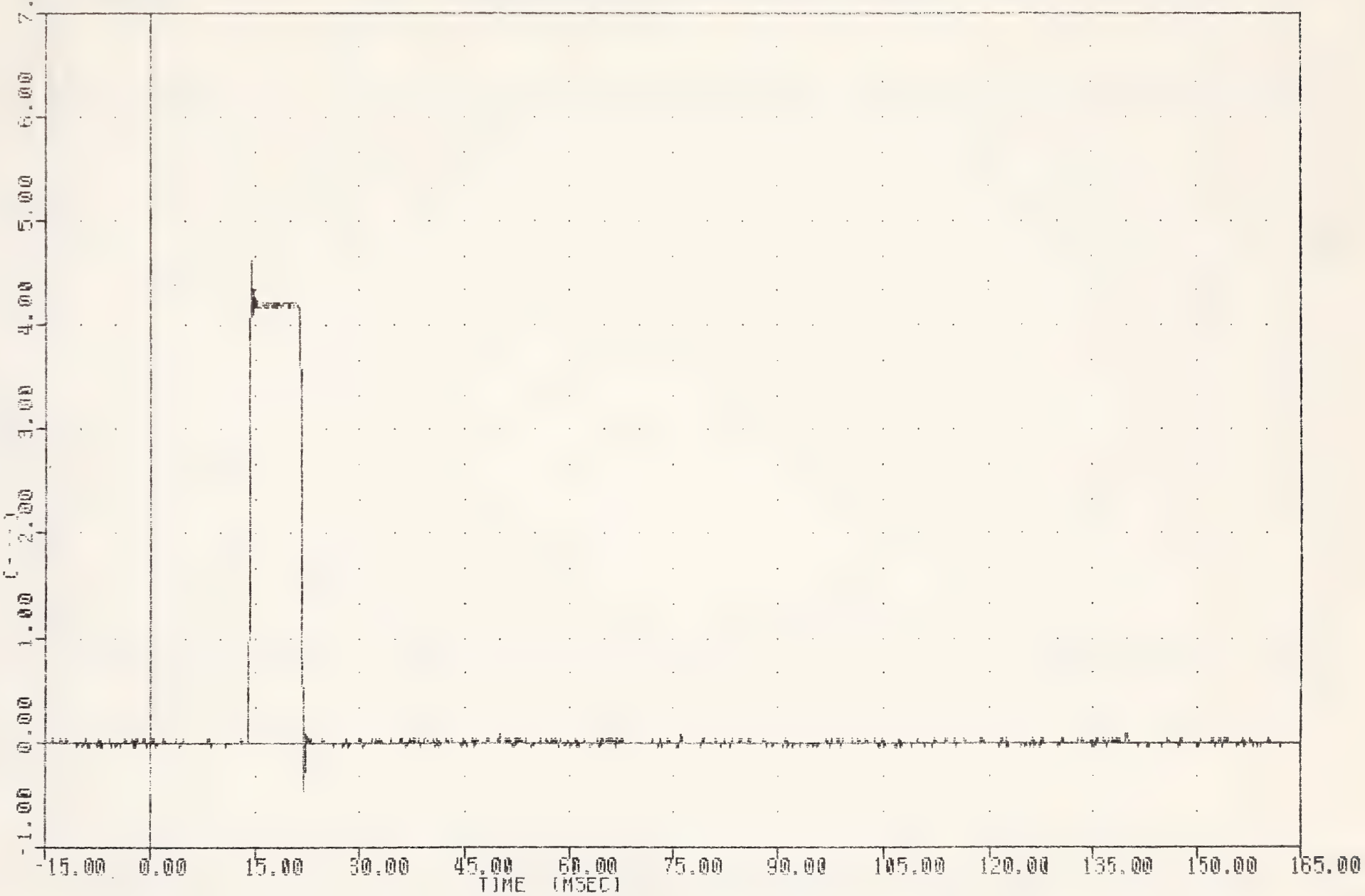


LEFT FEMUR FORCE PASSENGER

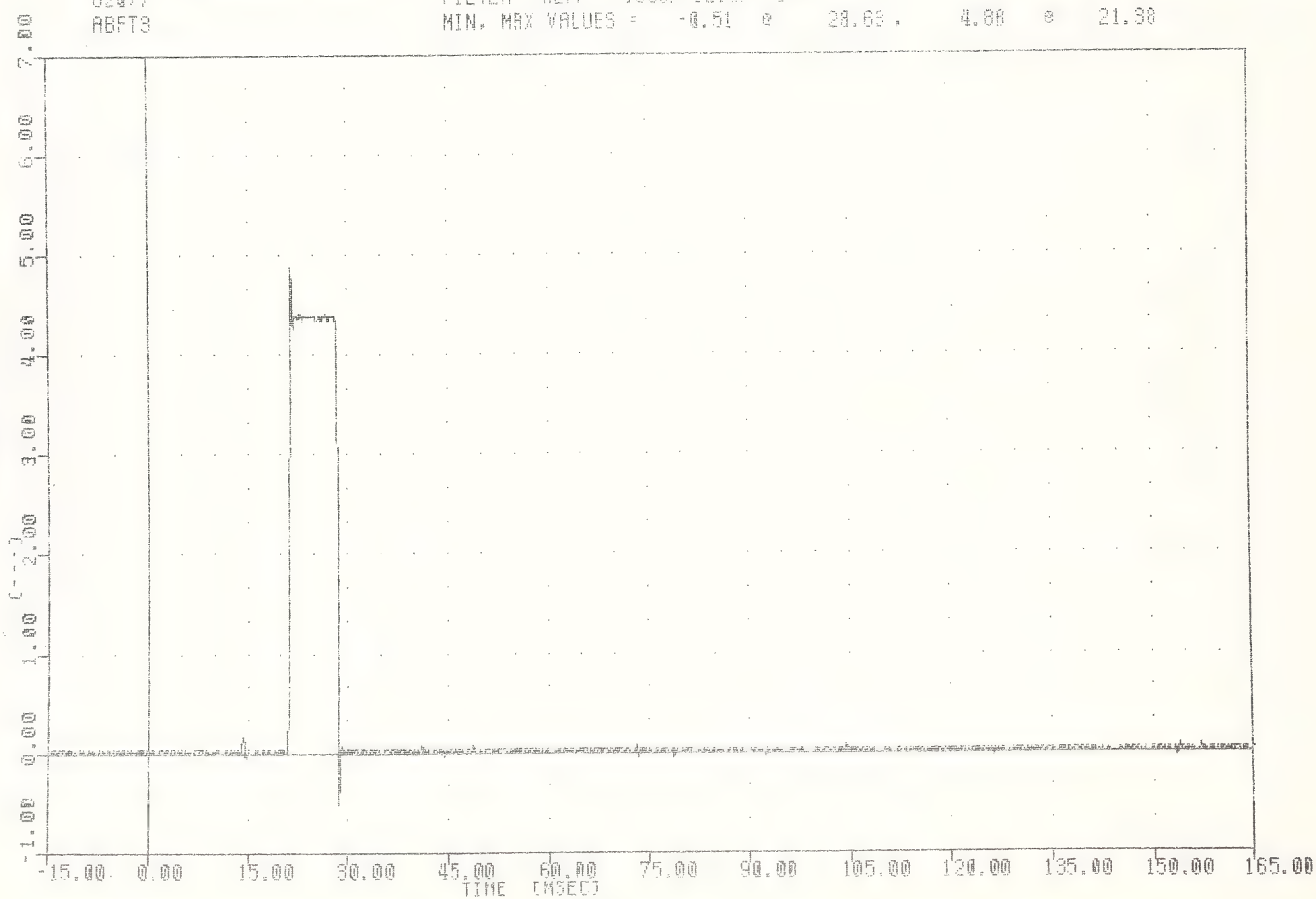


RIGHT FEMUR FORCE PASSENGER

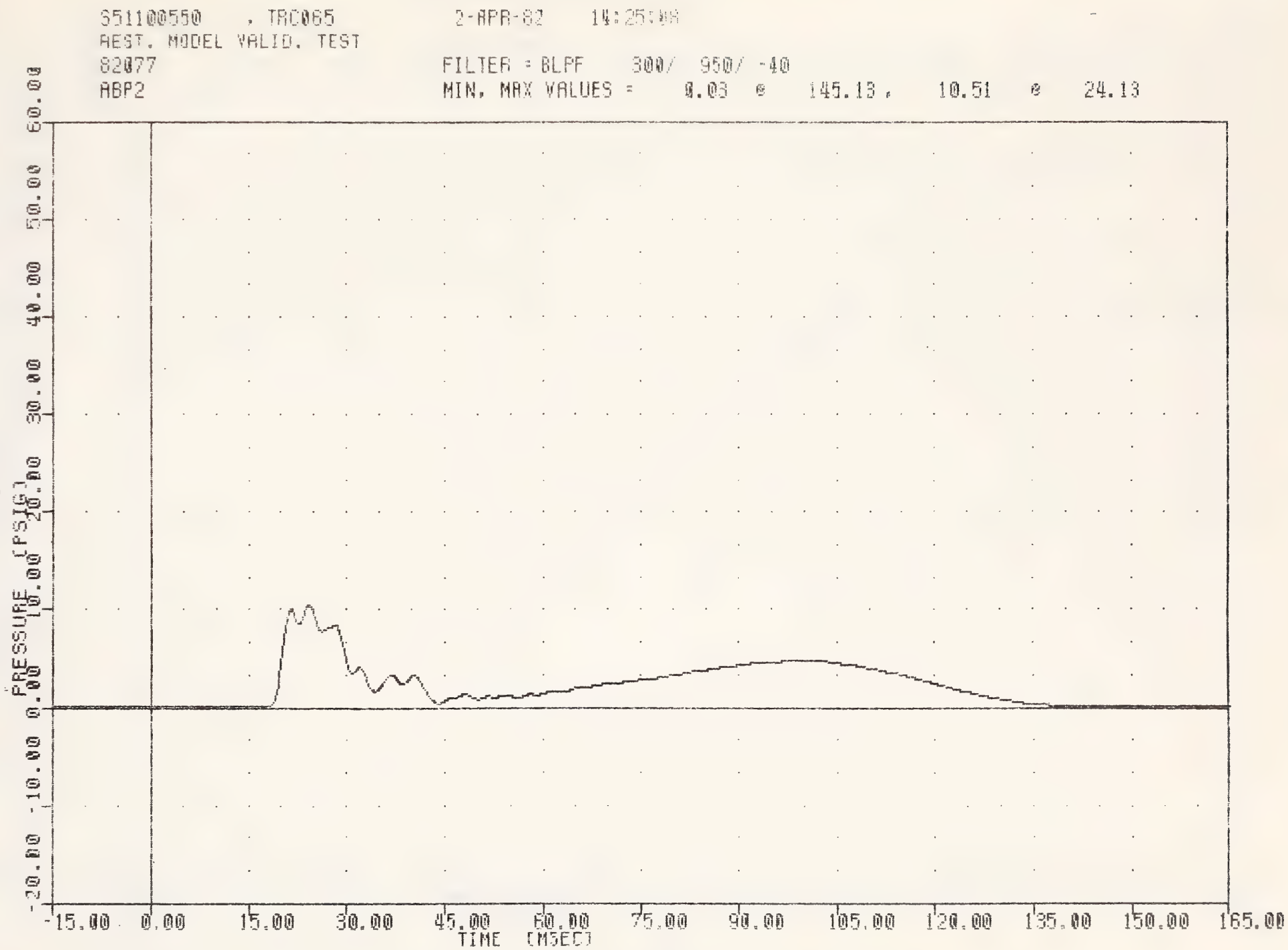
S51100550 , TRC065 2-APR-82 14:25:06
BEST, MODEL VALID, TEST
82077 FILTER = ALPF 1050/ 5214/ -40
ABFT2 MIN, MAX VALUES = -0.47 @ 21.88 , 4.61 @ 14.38



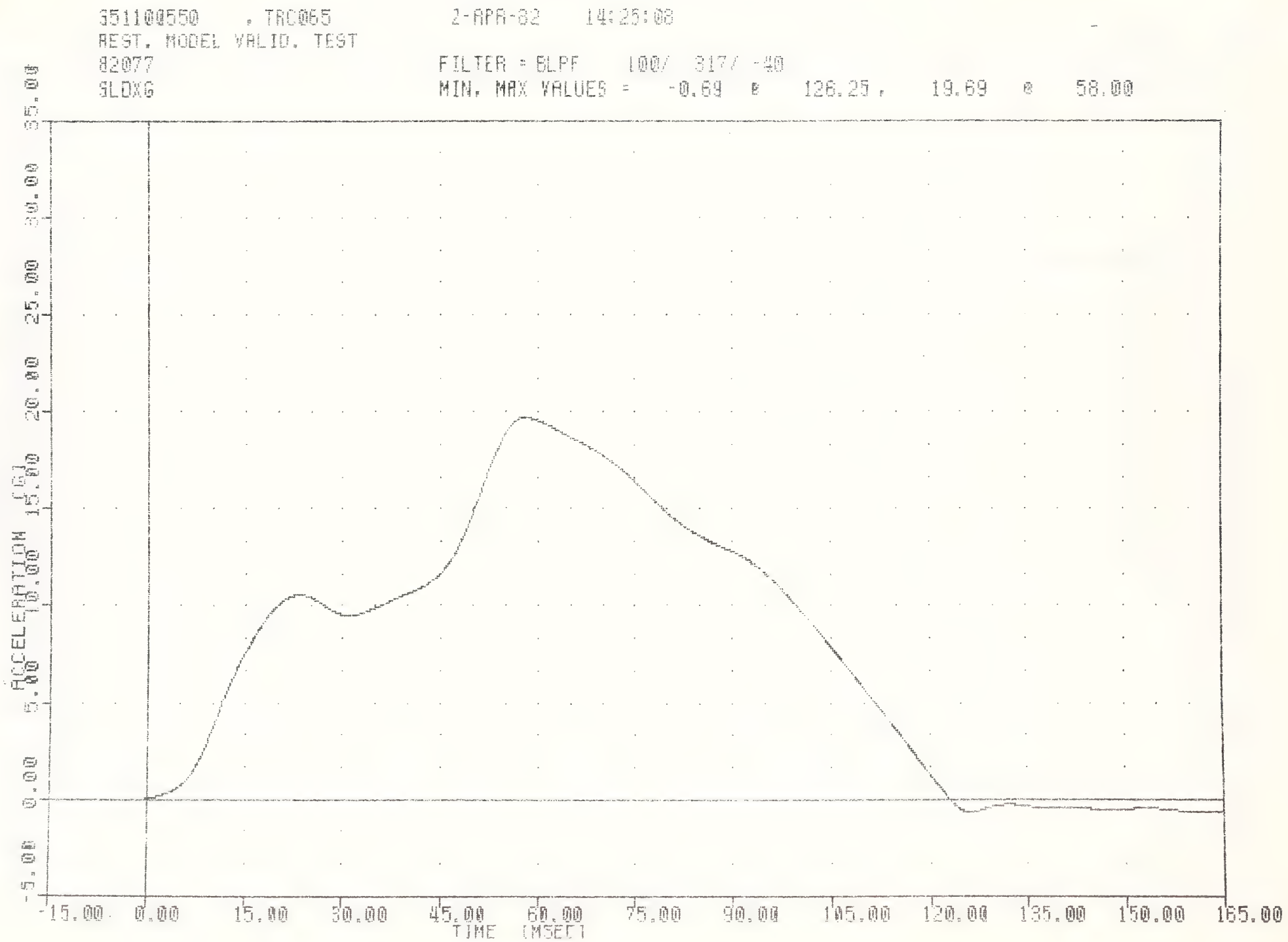
AIR BAG FIRING EVENT PASSENGER



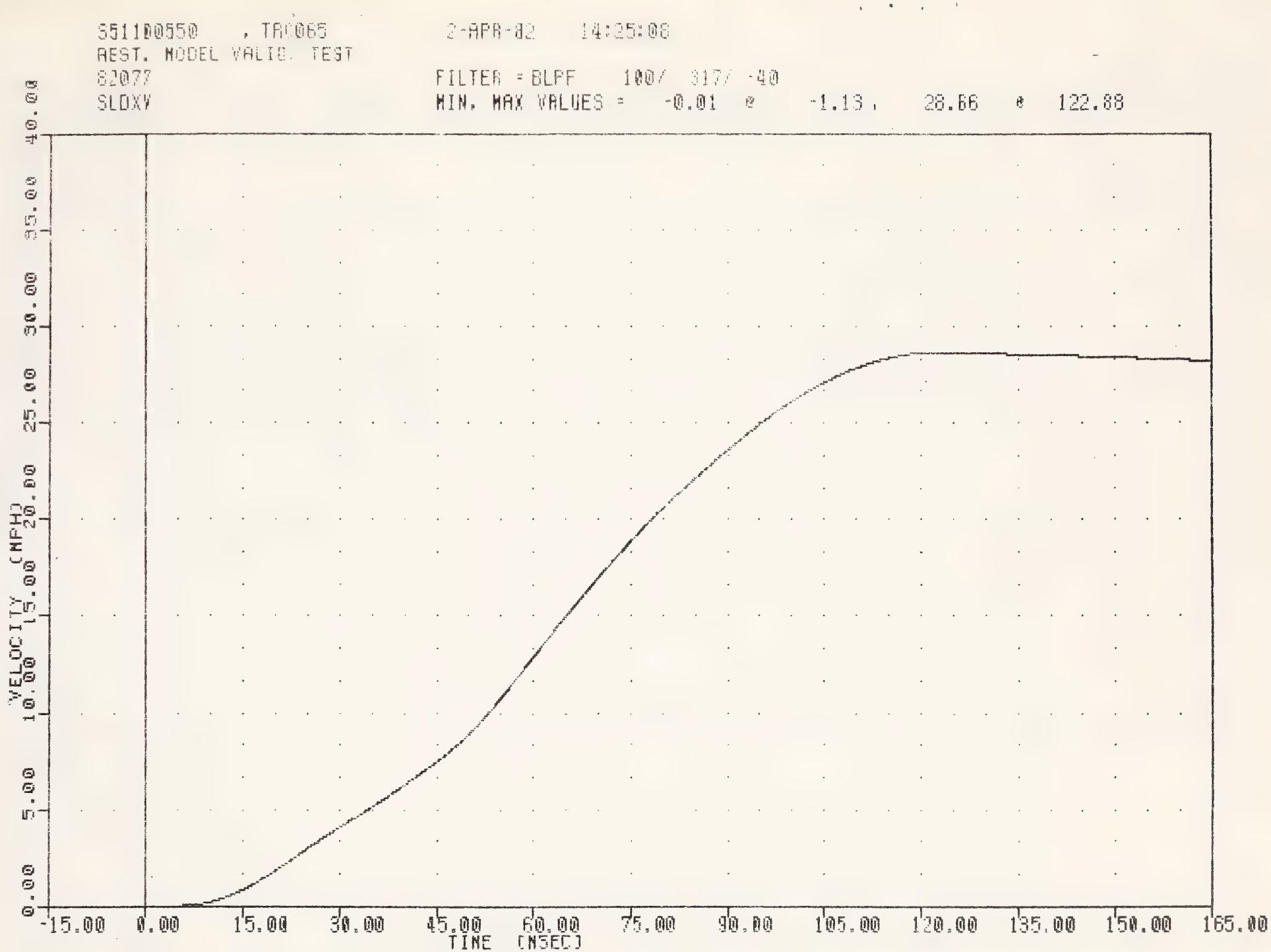
AIR BAG FIRING EVENT 3



AIR BAG PRESSURE PASSENGER

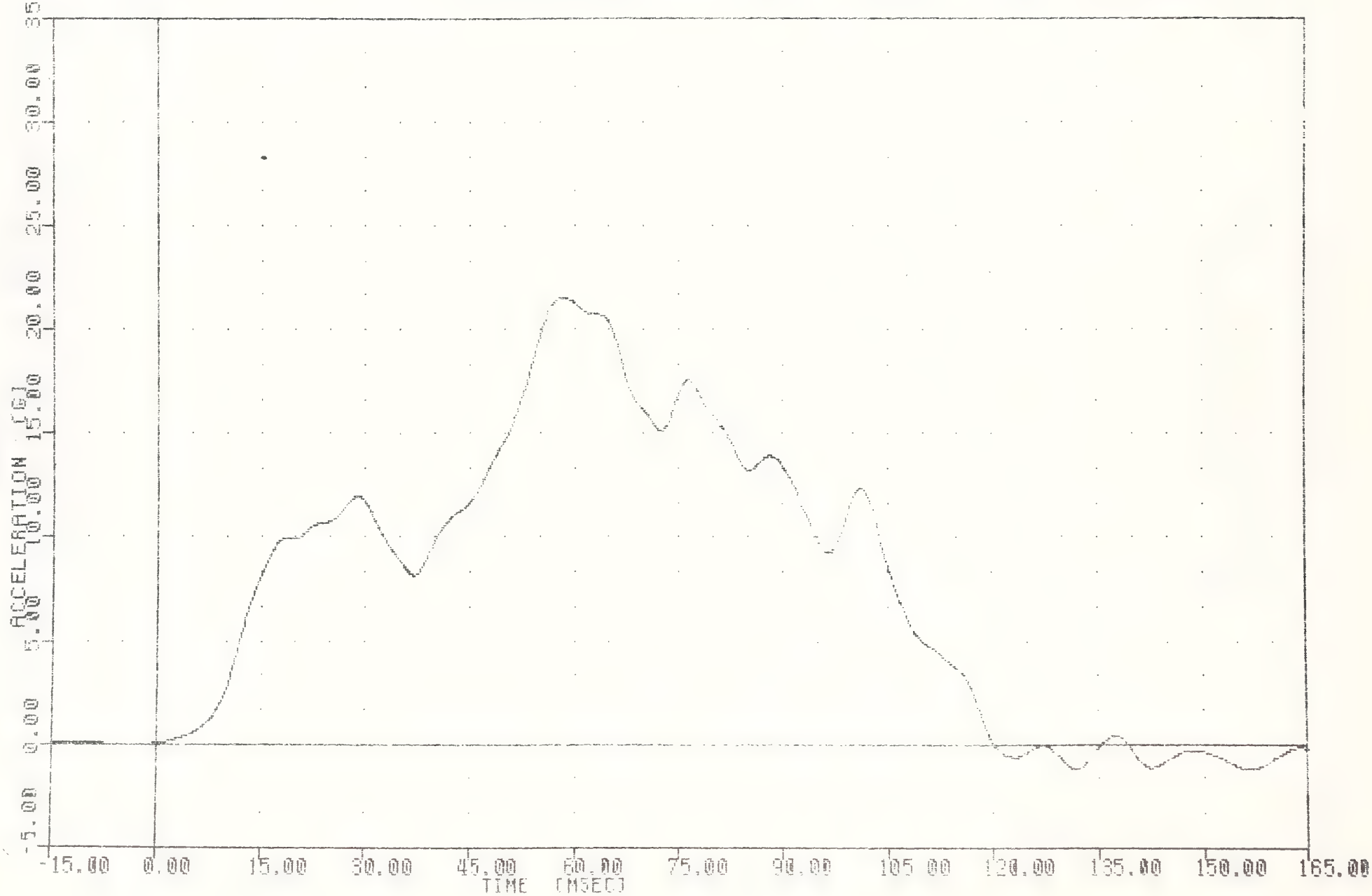


SLED ACCELERATION

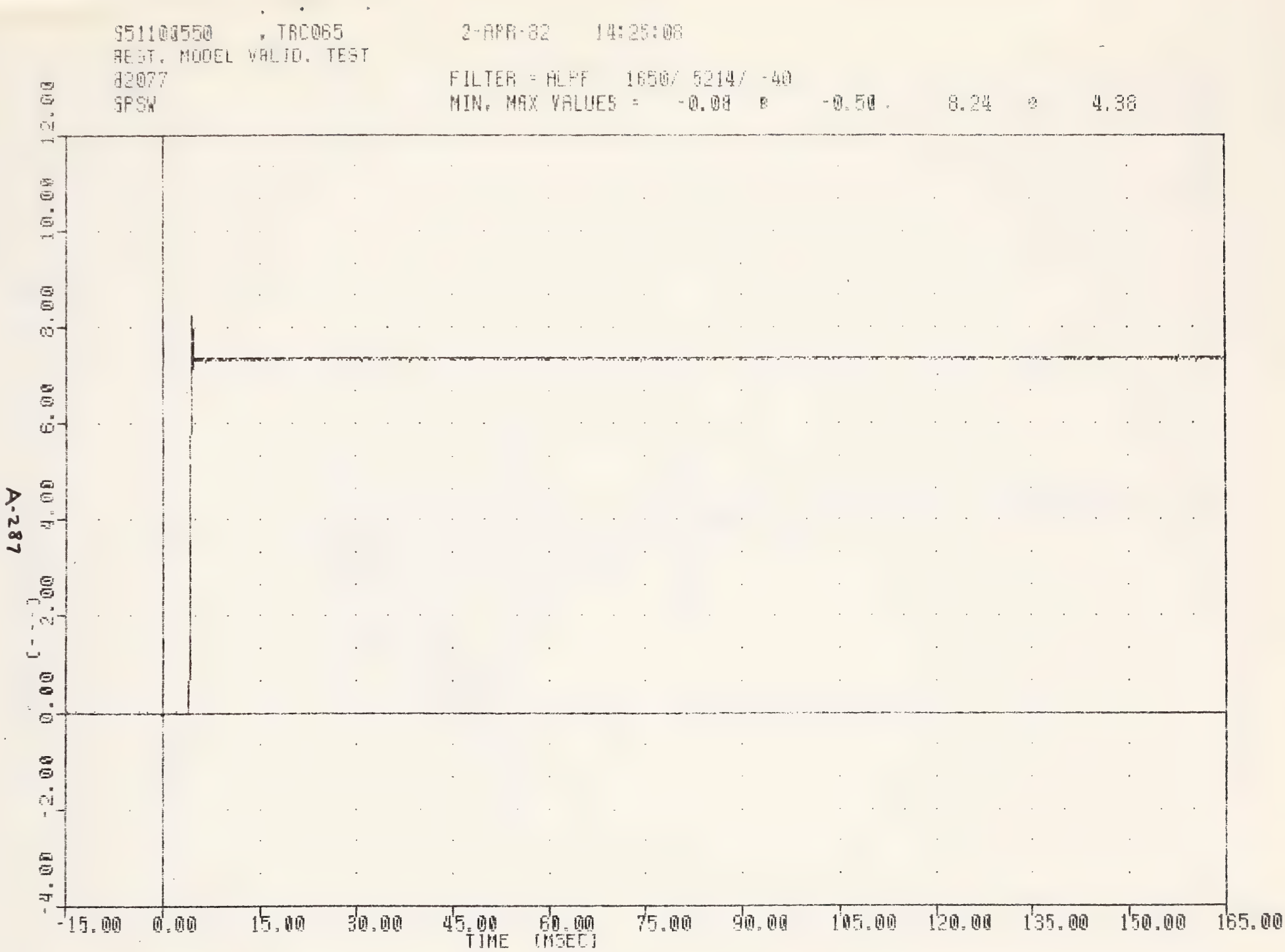


SLED VELOCITY IN MPH

S511000550 , TRC065 2-APR-82 14:25:08
REST. MODEL VALID. TEST
82077 FILTER = BLPF 100/ 817/ -48
FTUXG MIN. MAX VALUES = -1.25 @ 156.63 , 21.52 @ 58.25

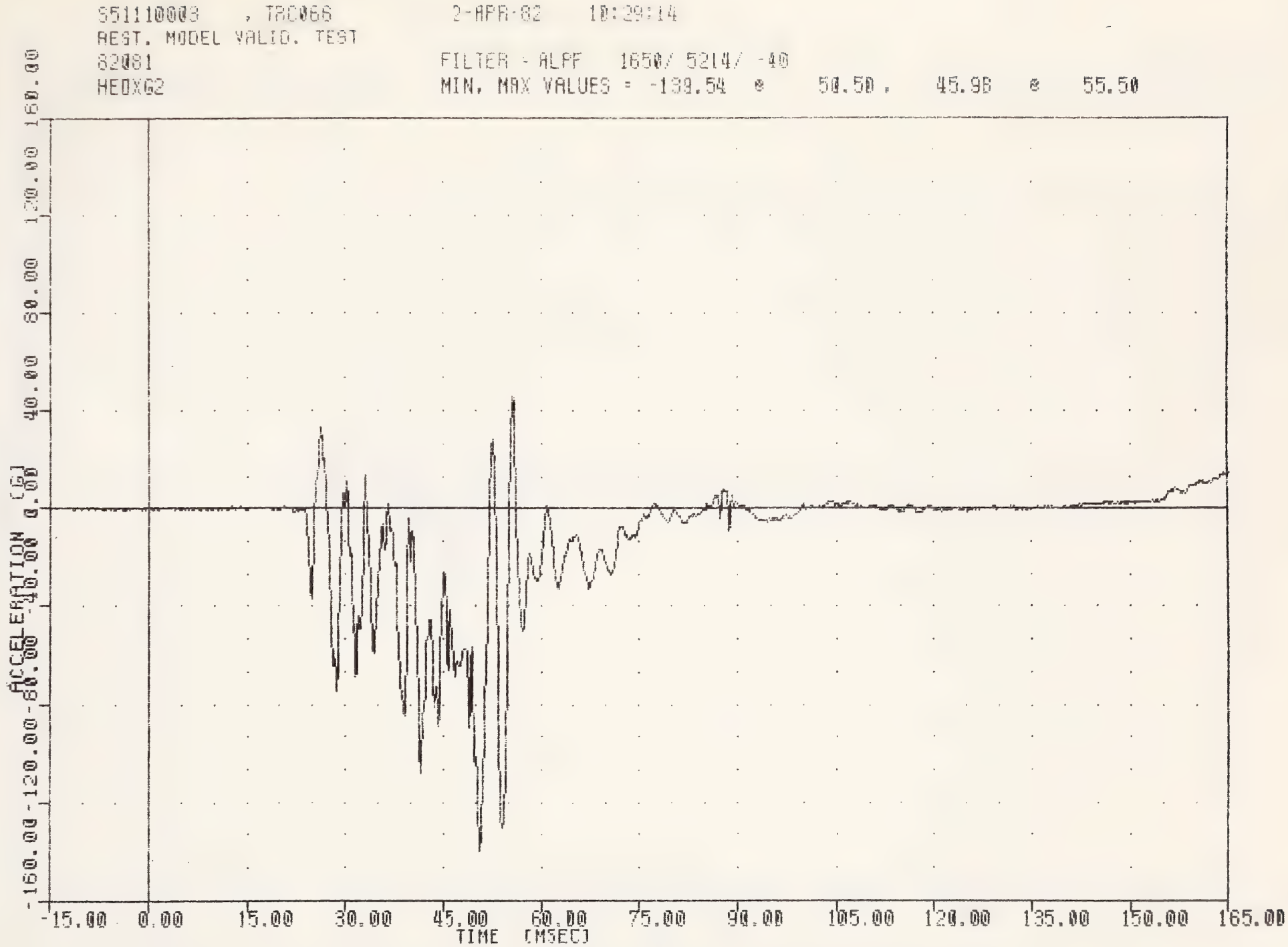


FLOOR PAN TUNNEL ACCELERATION

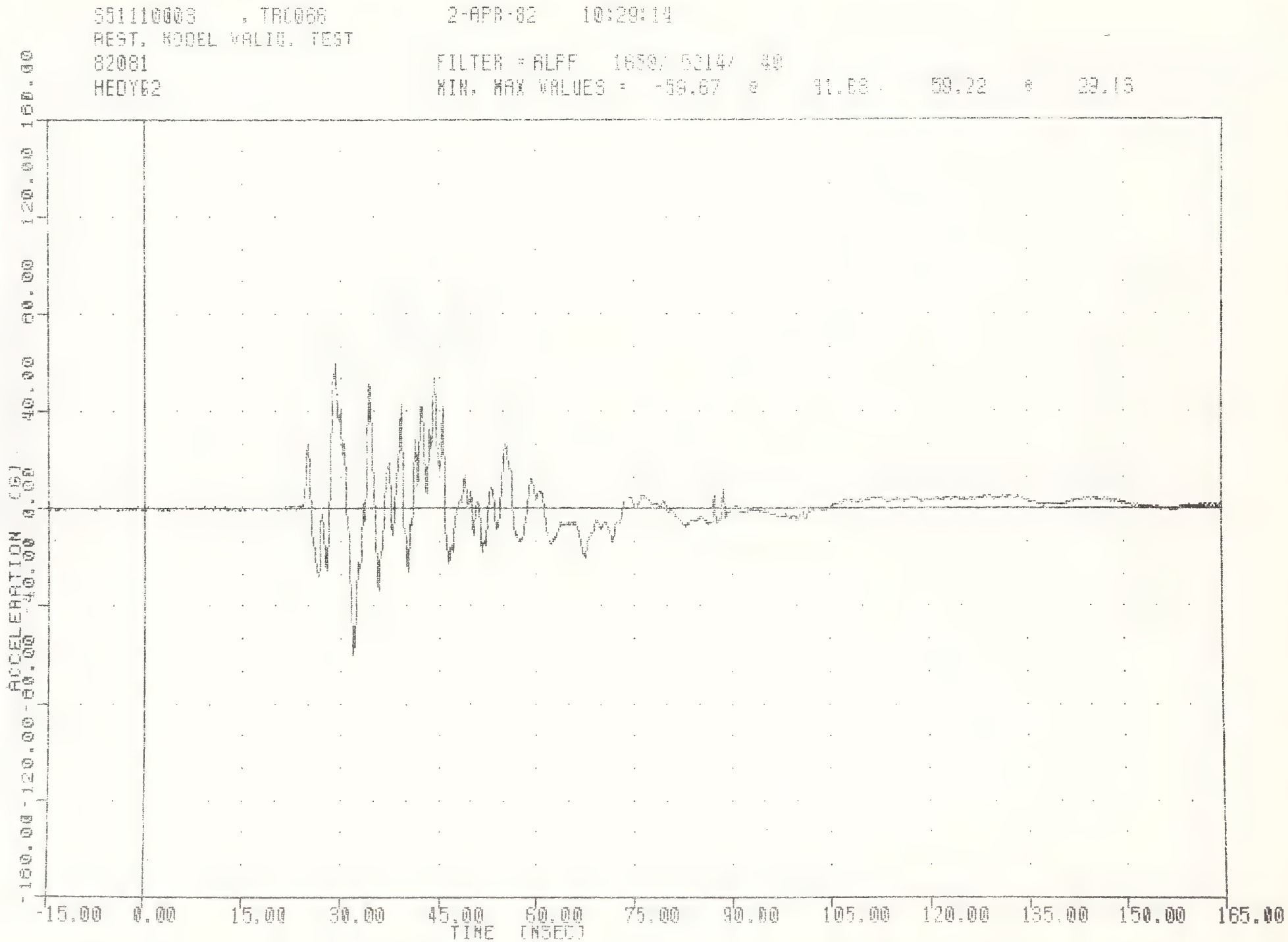


SLED POSITION SWITCH

TEST NO. 11

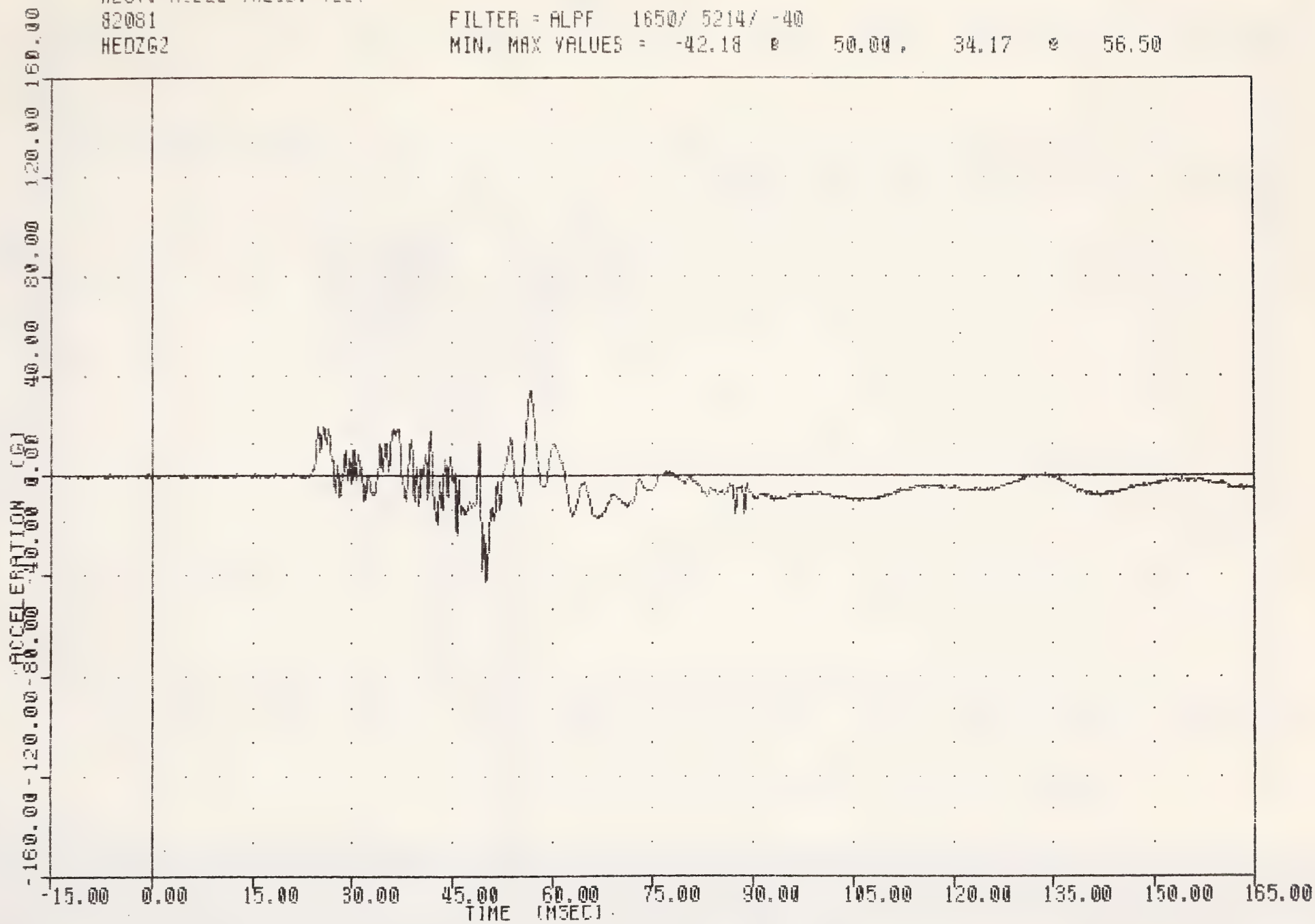


HEAD ACCELERATION X AXIS PASSENGER

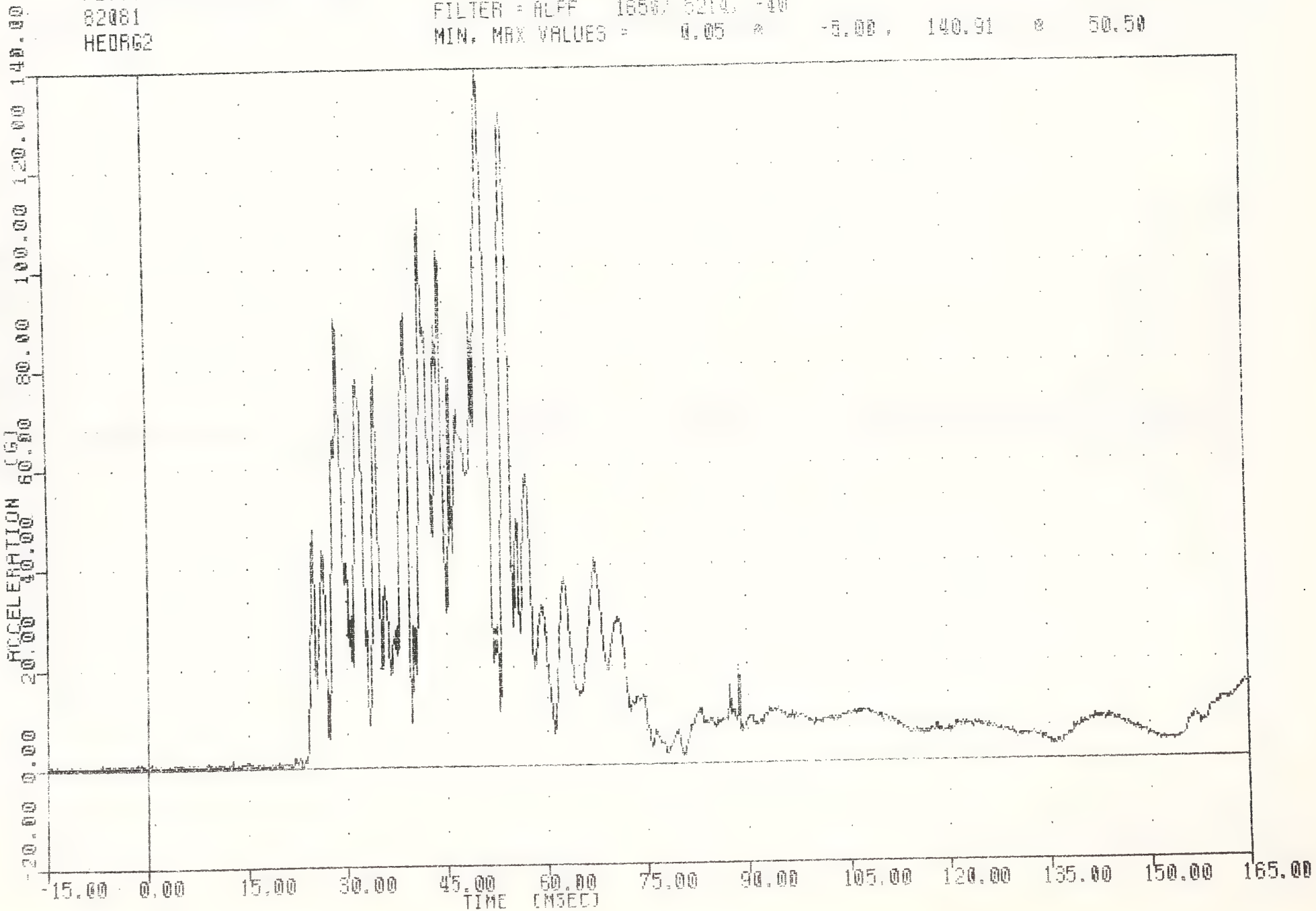


HEAD ACCELERATION Y AXIS PASSENGER

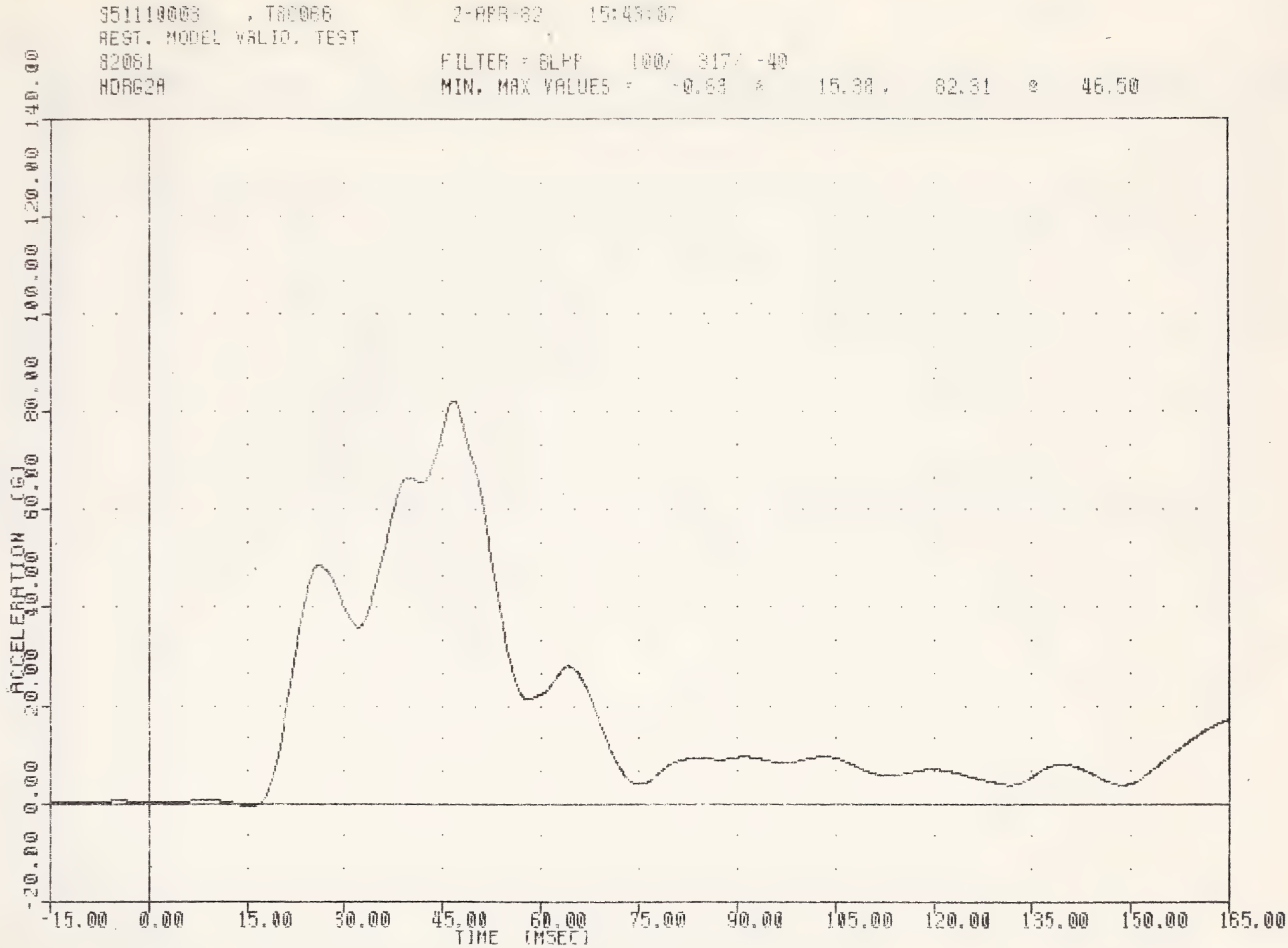
S51110003 . TRC066 2-APR-82 10:28:14
BEST. MODEL VALID. TEST
82081 FILTER = ALPF 1650/ 5214/ -40
HEDZG2 MIN. MAX VALUES = -42.18 @ 50.00 , 34.17 @ 56.50



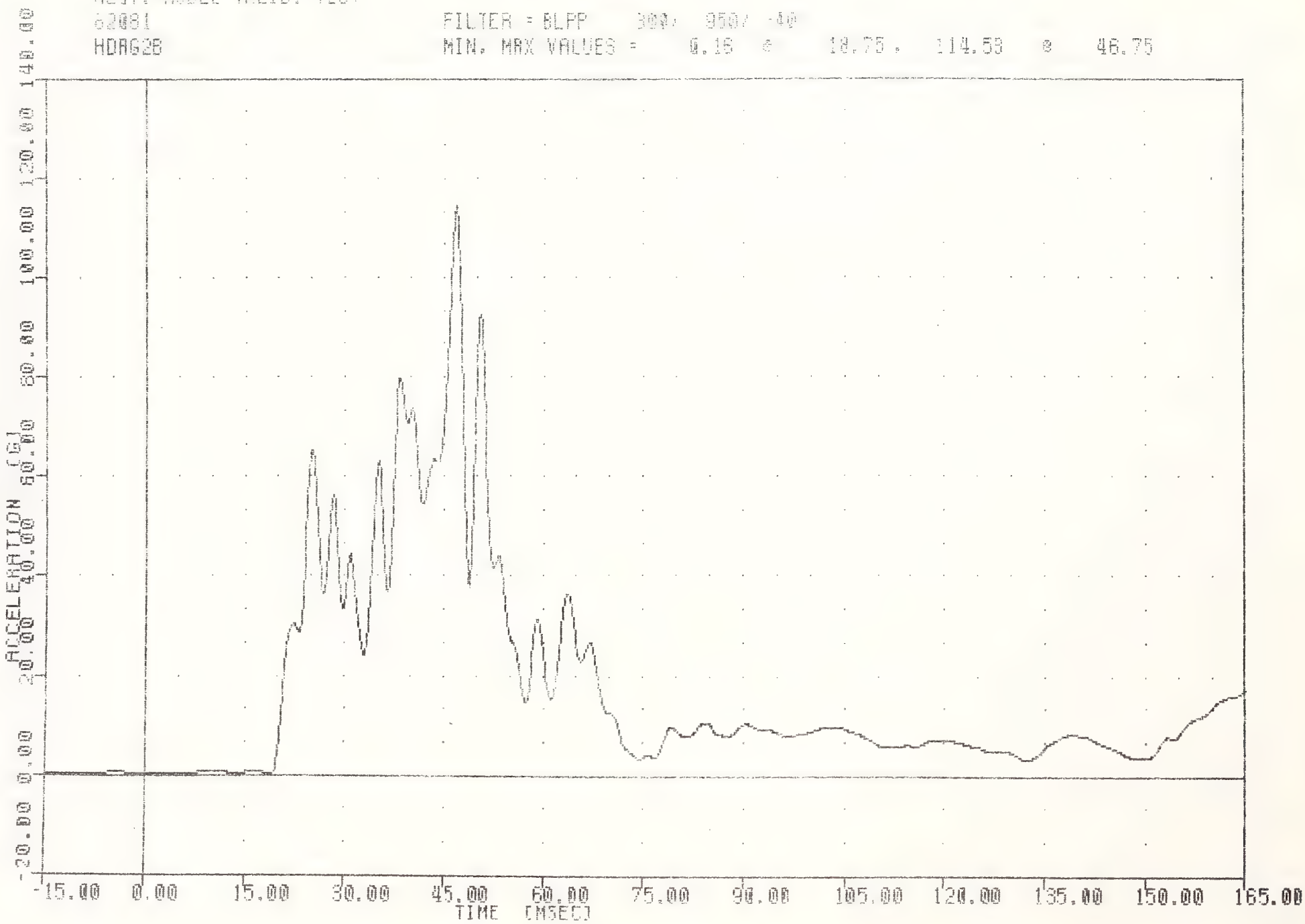
HEAD ACCELERATION Z AXIS PASSENGER



HEAD ACCELERATION RESULTANT PASSENGER

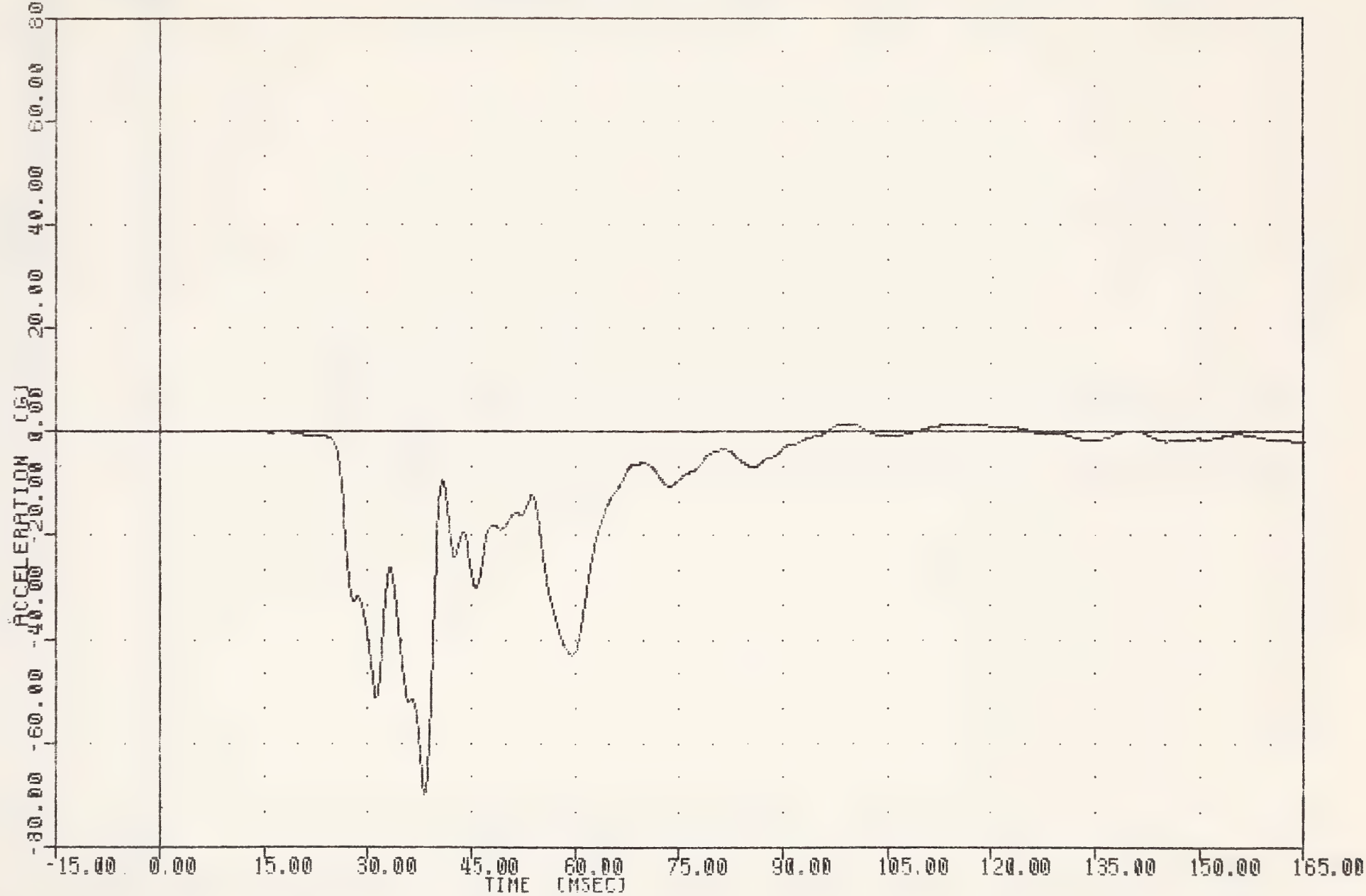


3 YR OLD HEAD RESULTANT (CLASS 100)

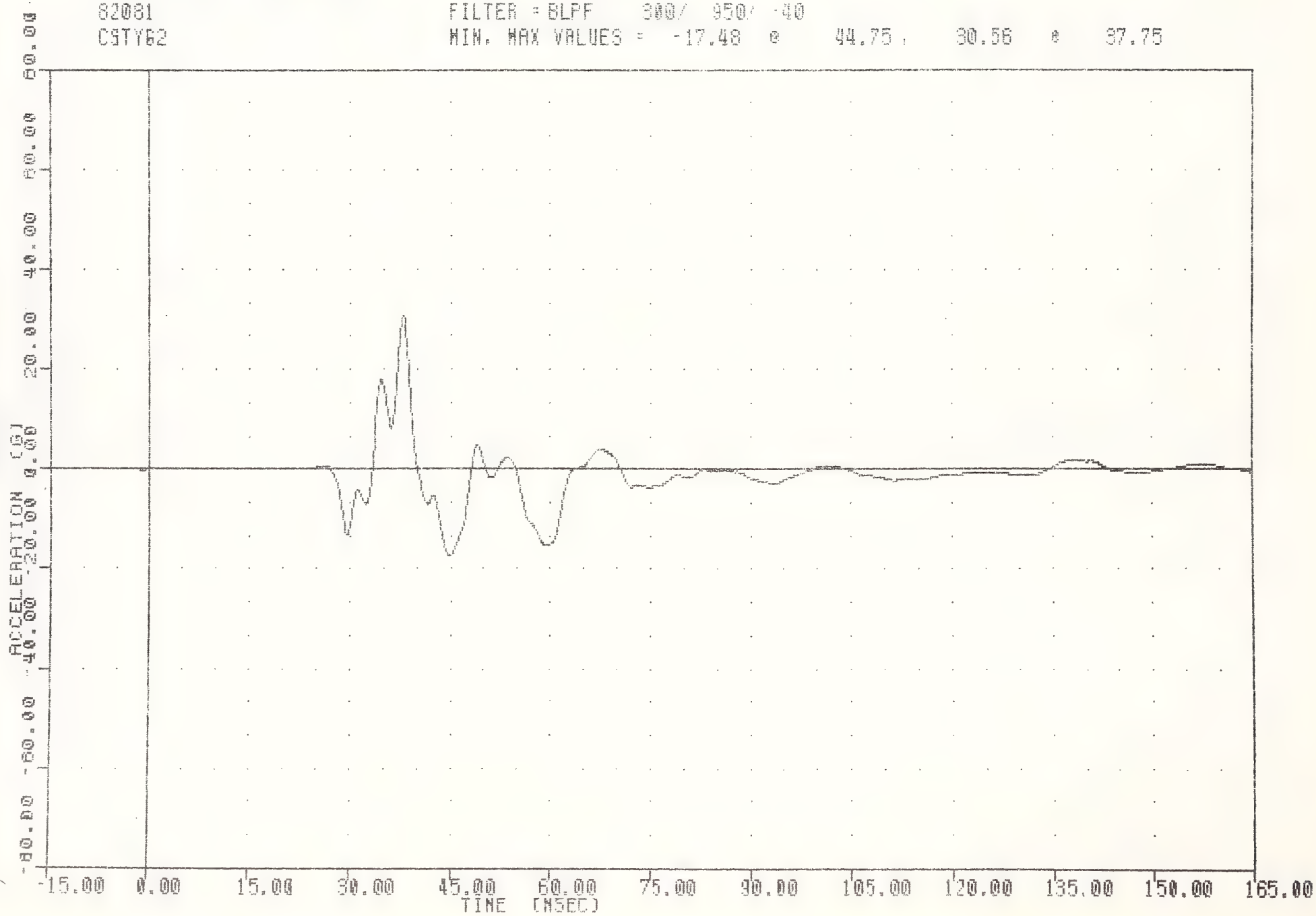


3 YR OLD HEAD RESULTANT (CLASS 180)

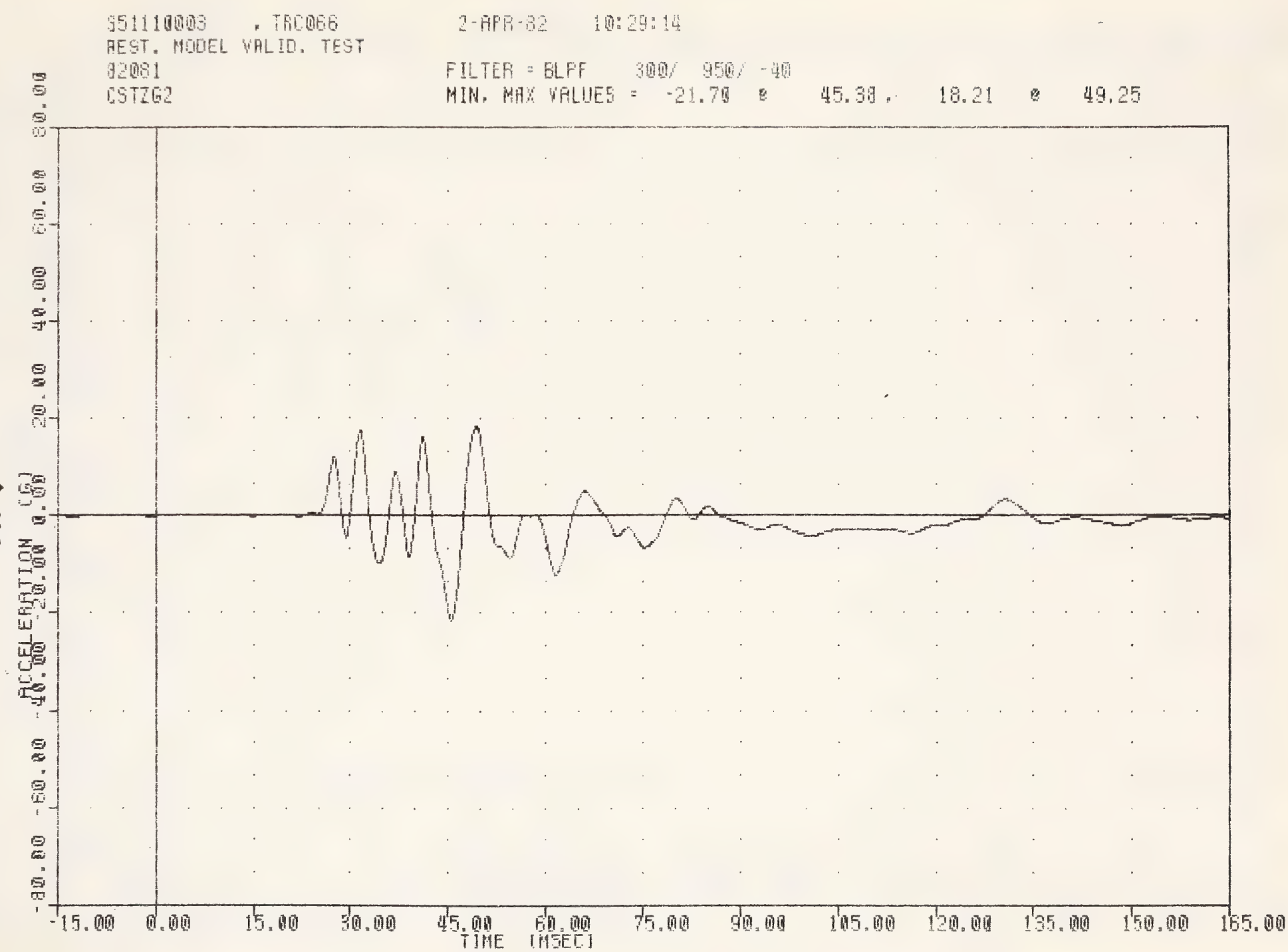
S51110003 , TRC066 2-APR-82 10:29:14
REST. MODEL VALID. TEST
82081 FILTER = BLPF 300/ 950/ -40
CSTXG2 MIN. MAX VALUES = -69.83 @ 38.13 , 1.44 @ 99.75



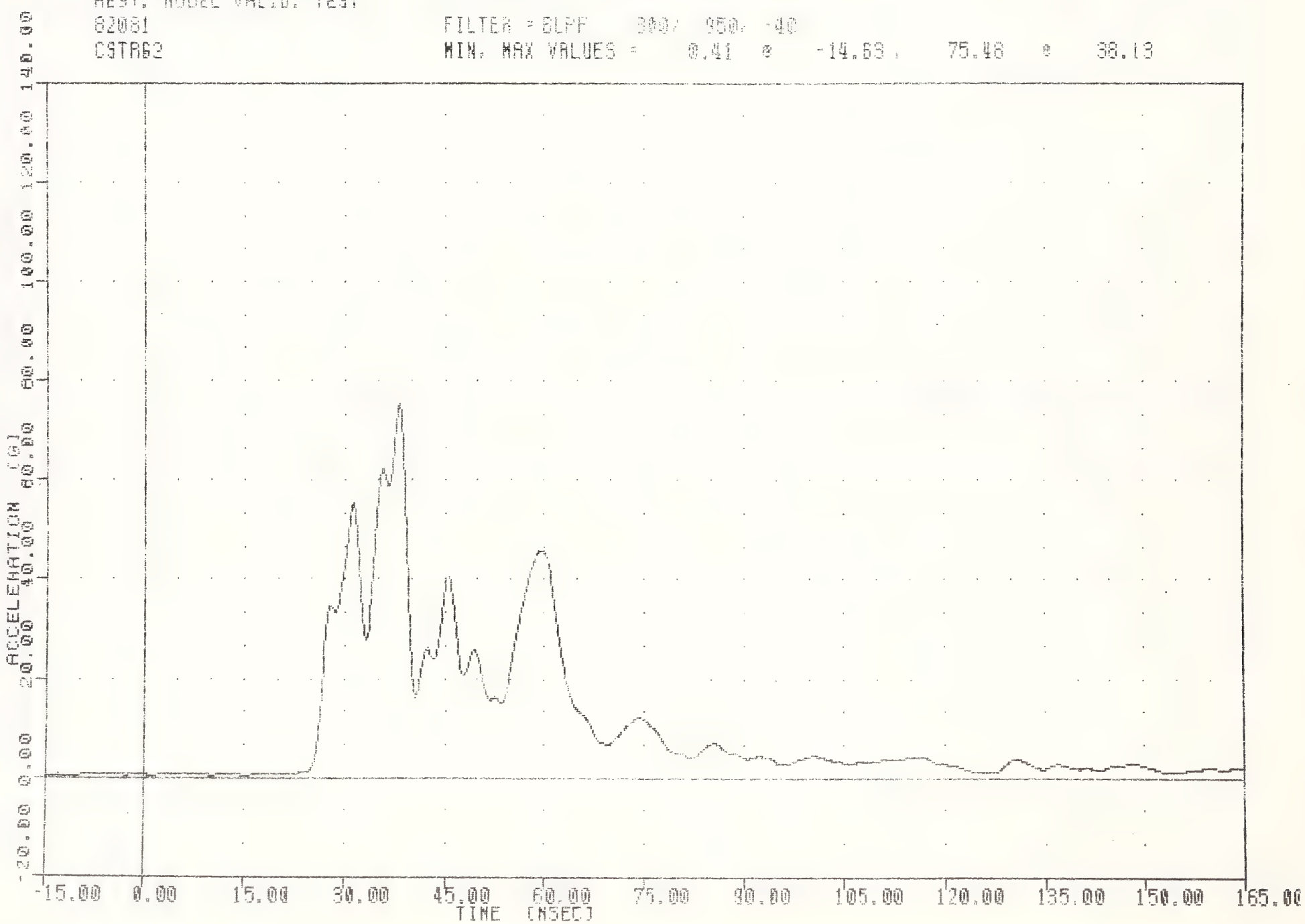
CHEST ACCELERATION X AXIS PASSENGER



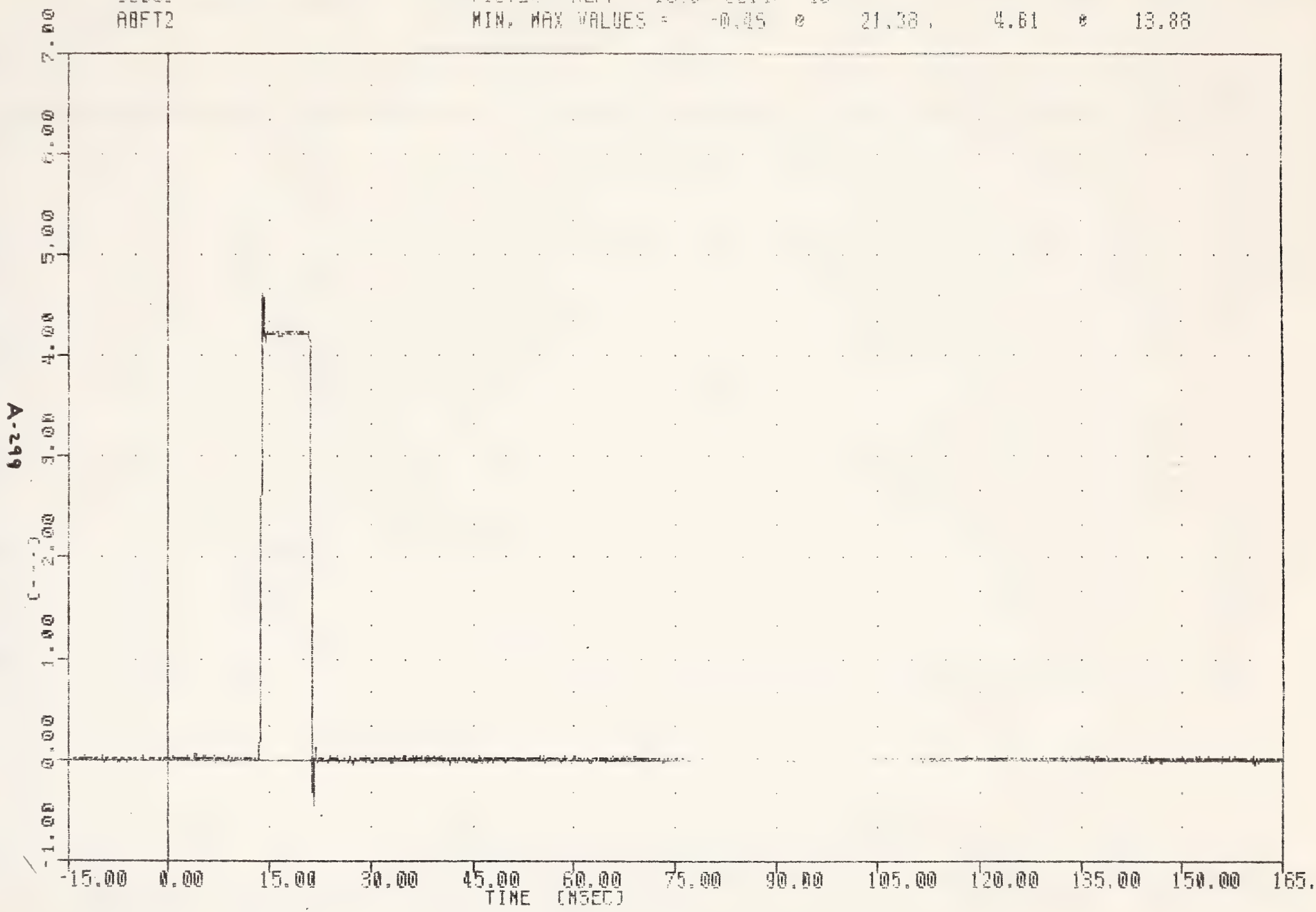
CHEST ACCELERATION Y AXIS PASSENGER



CHEST ACCELERATION Z AXIS PASSENGER

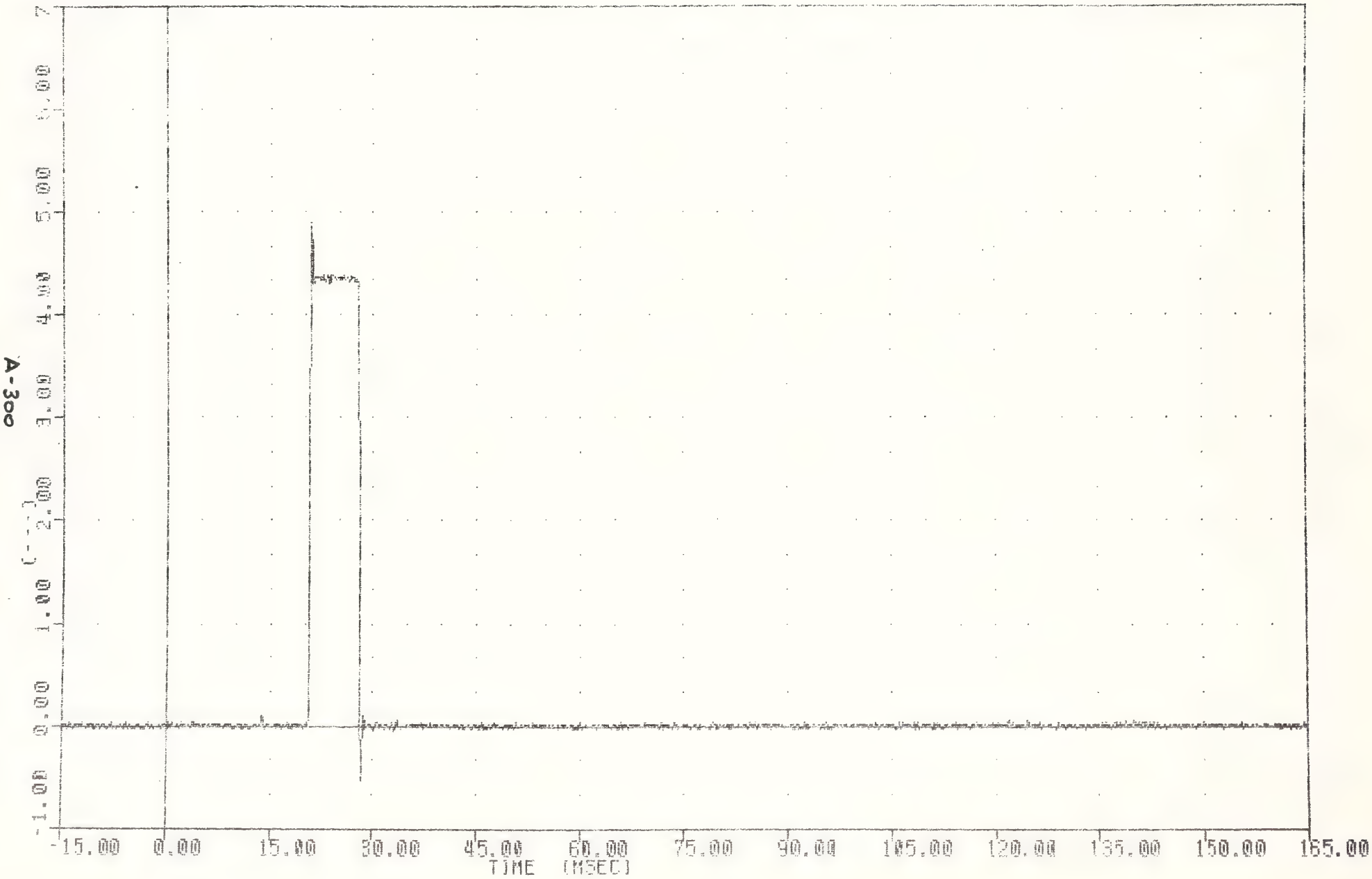


CHEST ACCELERATION RESULTANT. PASSENGER

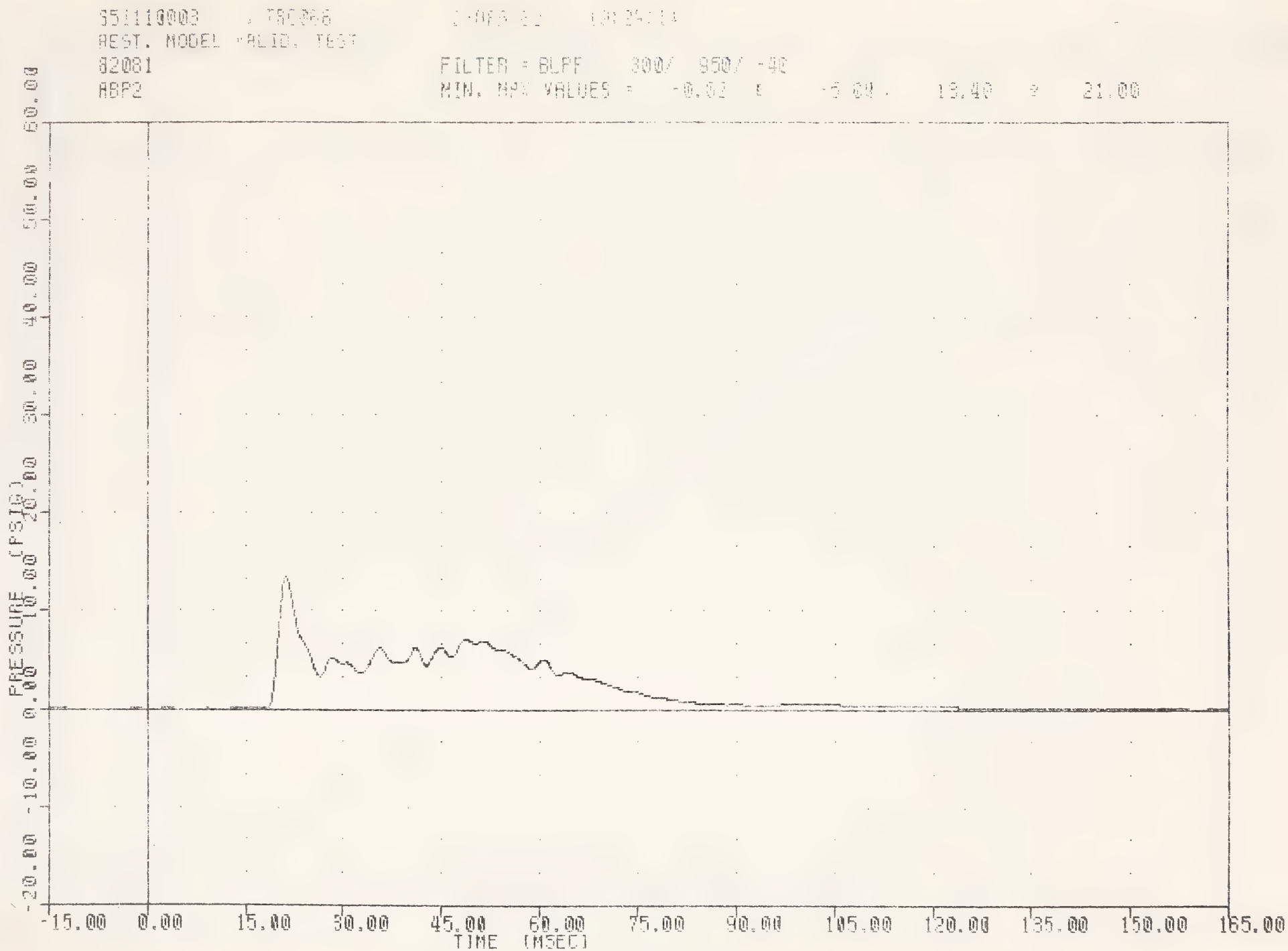


AIR BAG FIRING EVENT PASSENGER

S5111W003 , TRC086 2-APR-82 10:29:14
BEST. MODEL VALID. TEST
82081 FILTER = ALPF 1650/ 3214/ -40
ABFT3 MIN. MAX VALUES = -0.59 @ 28.13 . 4.89 @ 20.88

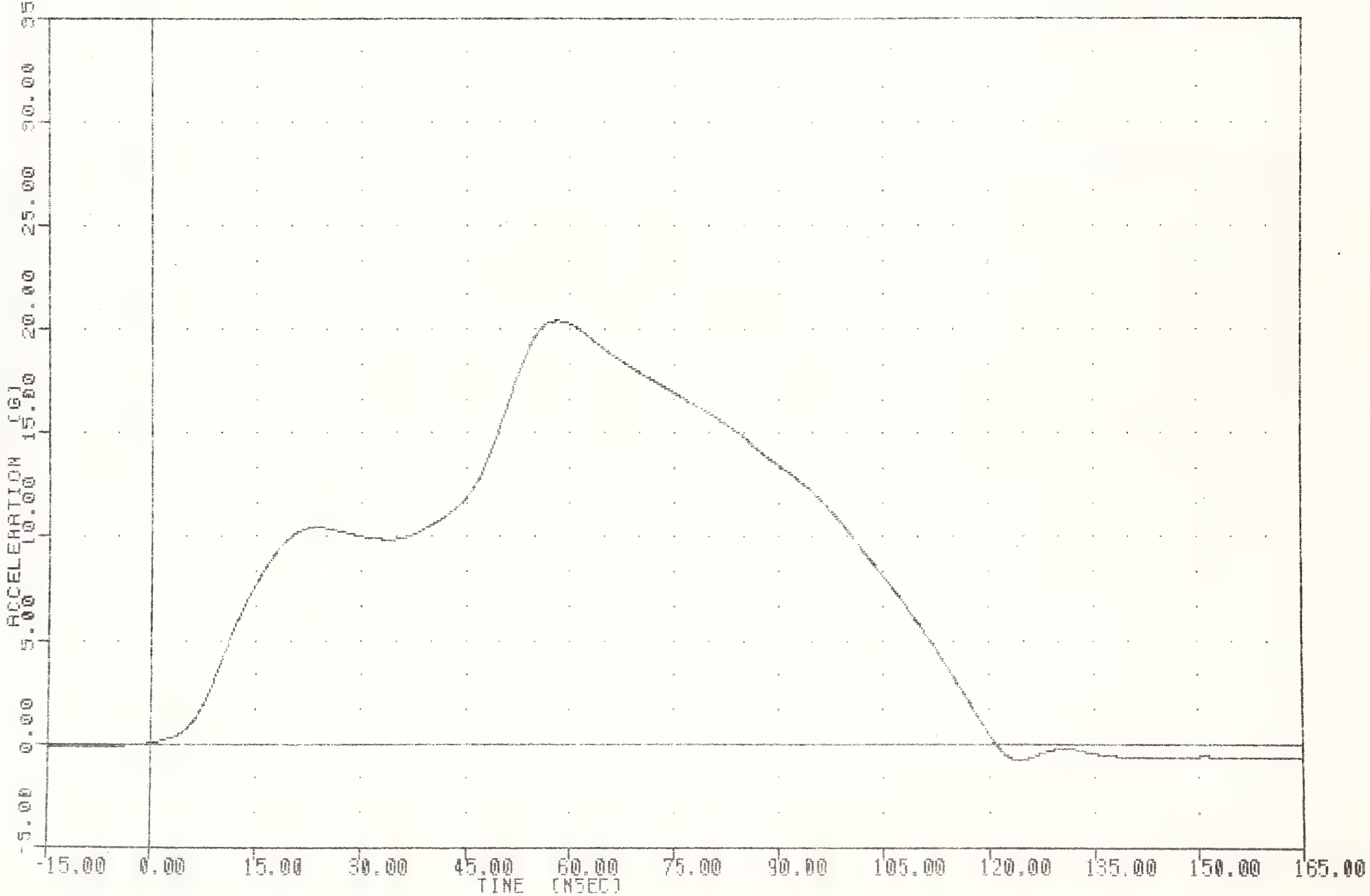


AIR BAG FIRING EVENT 3

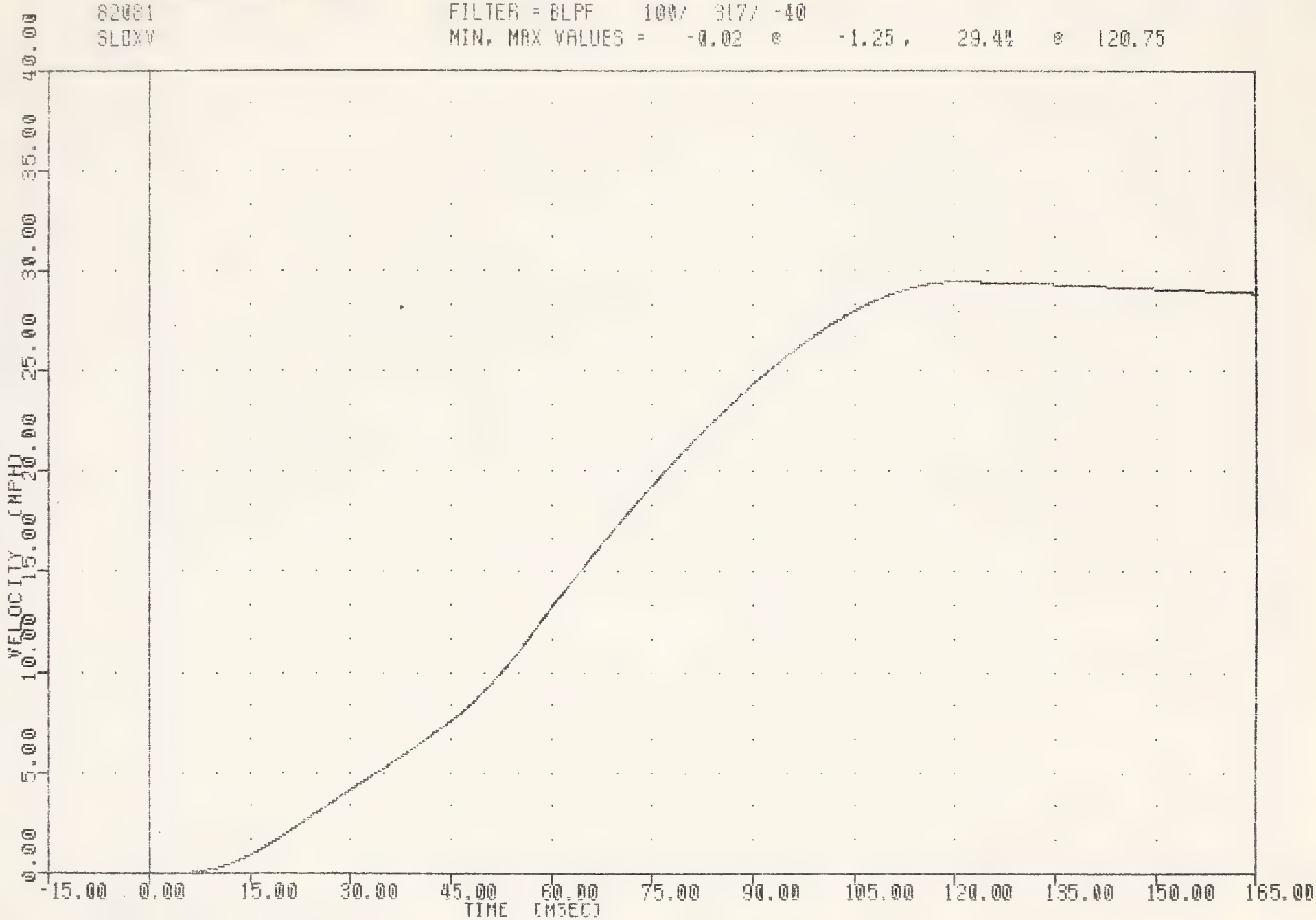


AIR BAG PRESSURE PASSENGER

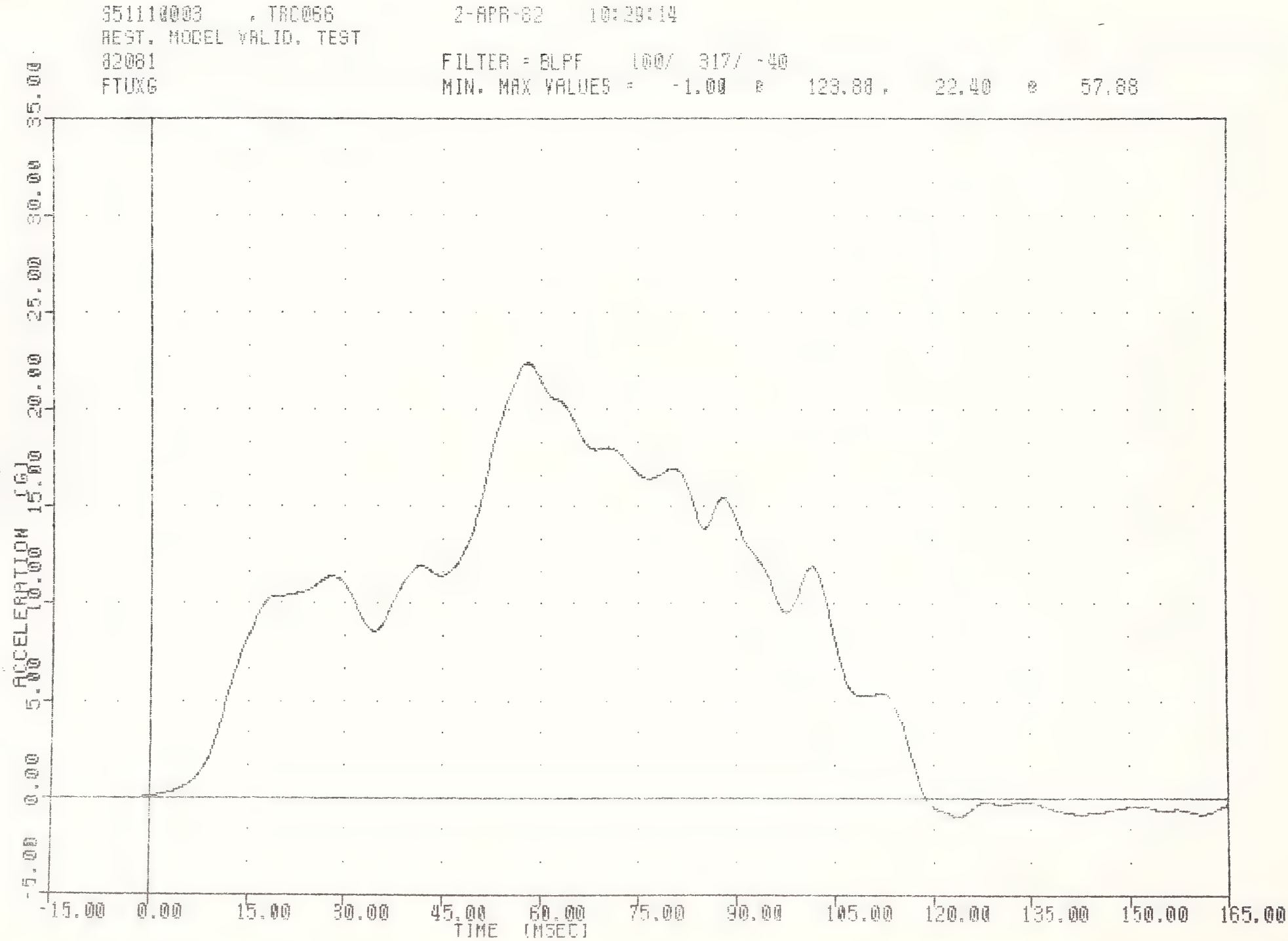
S511110003 , TRC066 2-APR-82 10:29:14
REST. MODEL VALID. TEST
82081 FILTER = BLPF 100/ 317/ -40
SLDXG MIN. MAX VALUES = -0.80 @ 124.13 , 20.39 @ 58.00



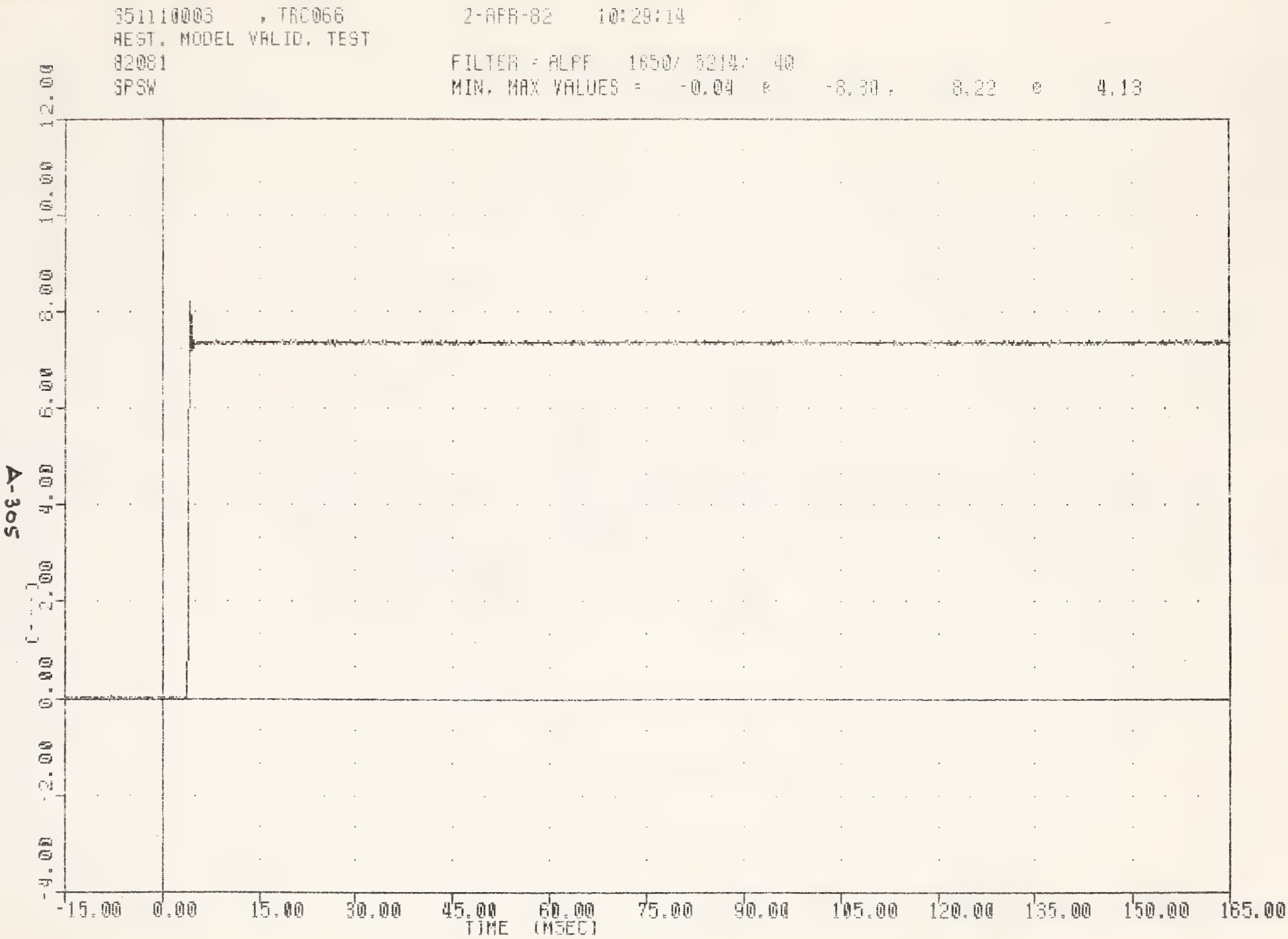
SLED ACCELERATION



SLED VELOCITY IN MPH



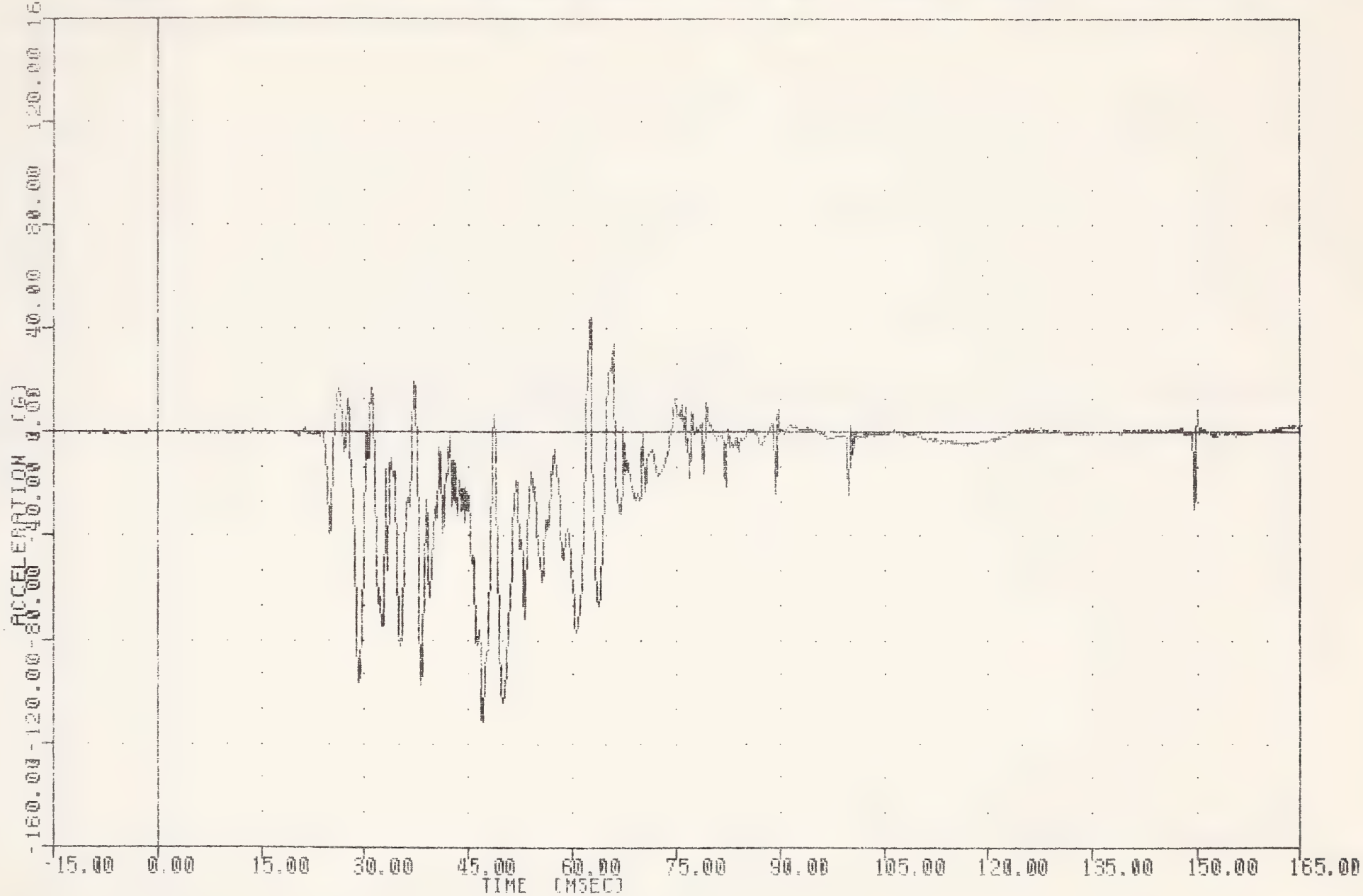
FLOOR PAN TUNNEL ACCELERATION



SLED POSITION SWITCH

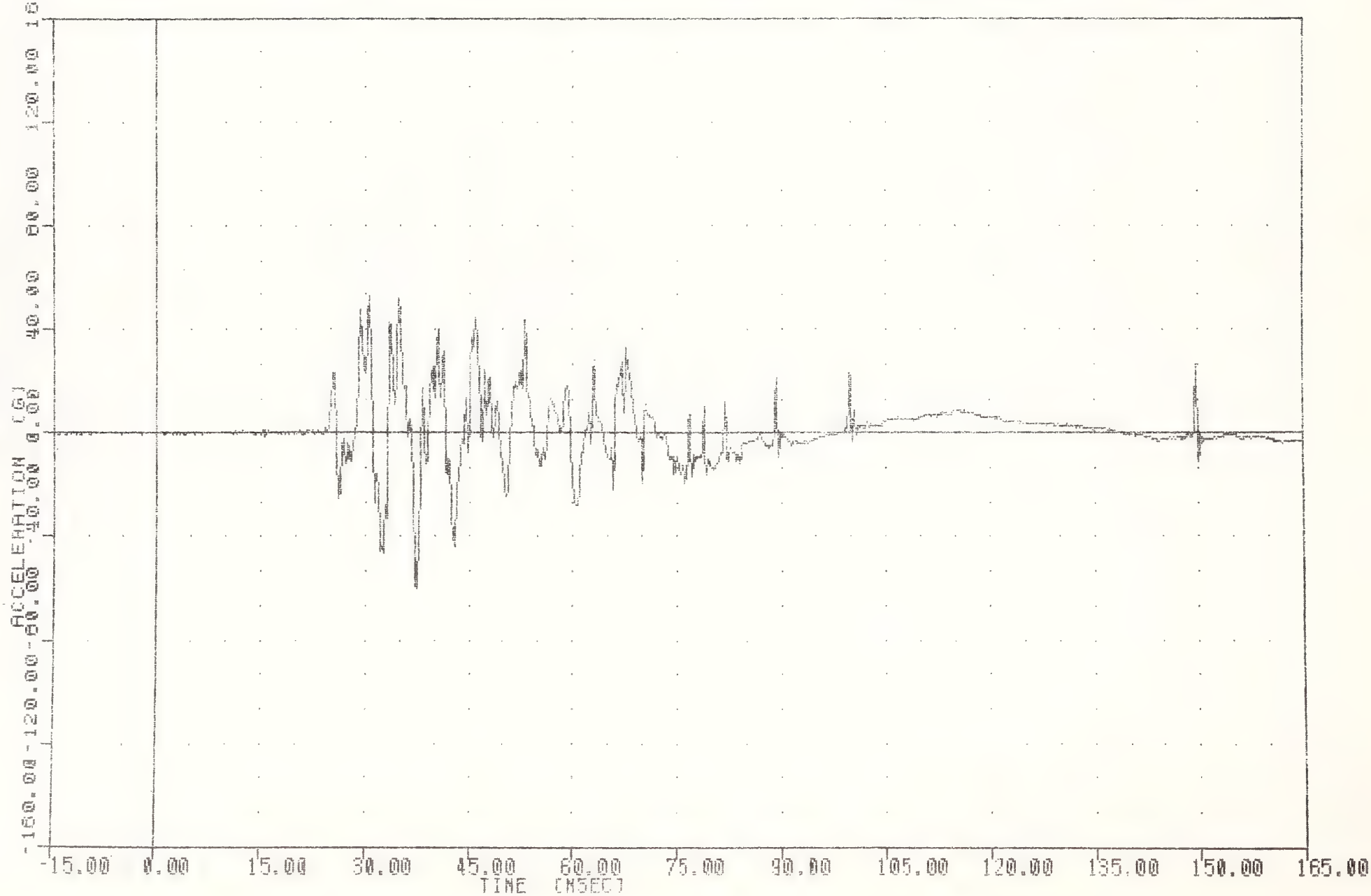
TEST NO. 12

S51120003 , TRC#57 2-APR-82 11:27:24
REST. MODEL VALID. TEST
82082 FILTER = ALPF 1650/ S210/ -40
HEOXG2 MIN, MAX VALUES = -112.19 @ 47.00 , 45.16 @ 62.50

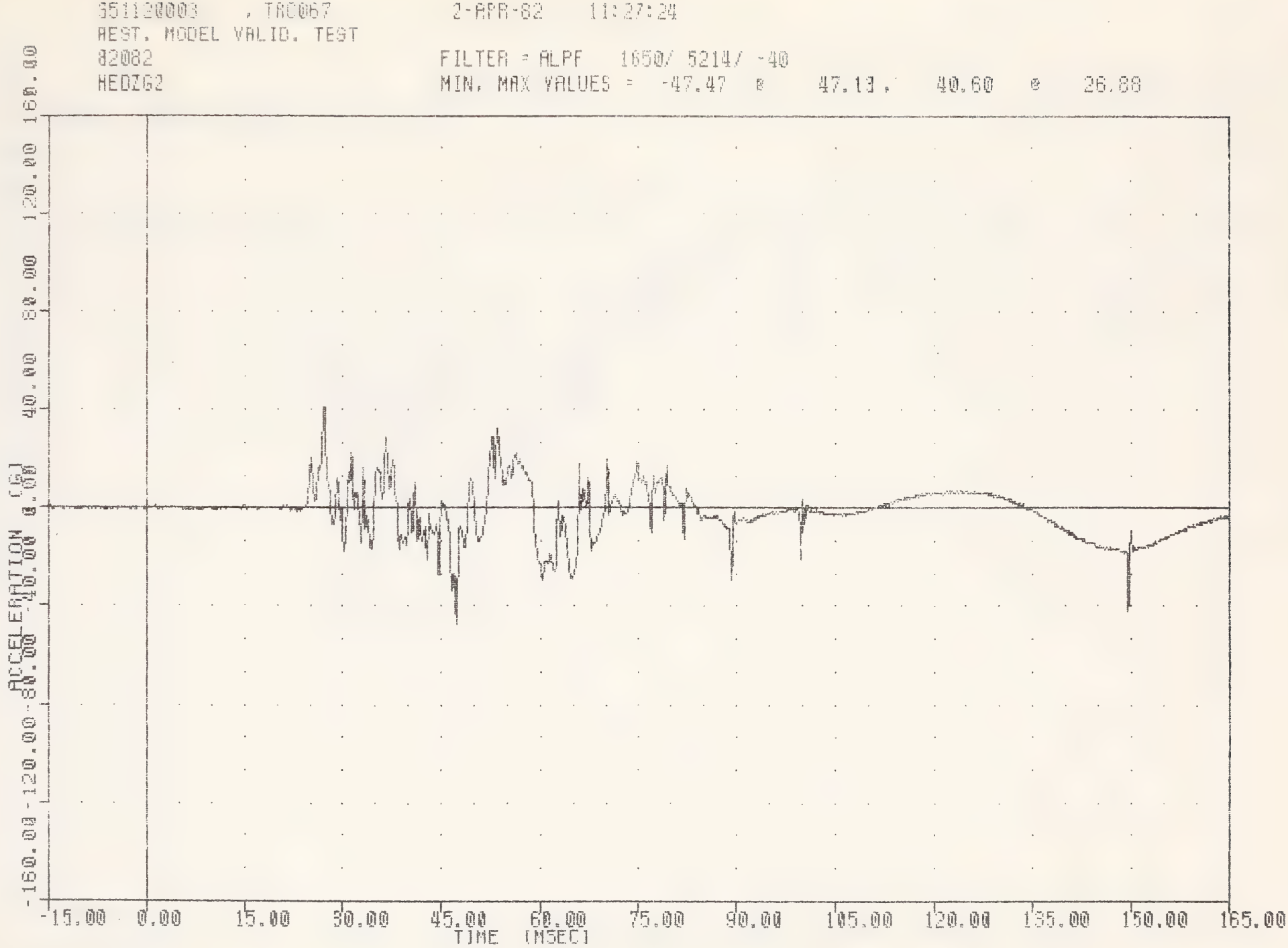


HEAD ACCELERATION X AXIS PASSENGER

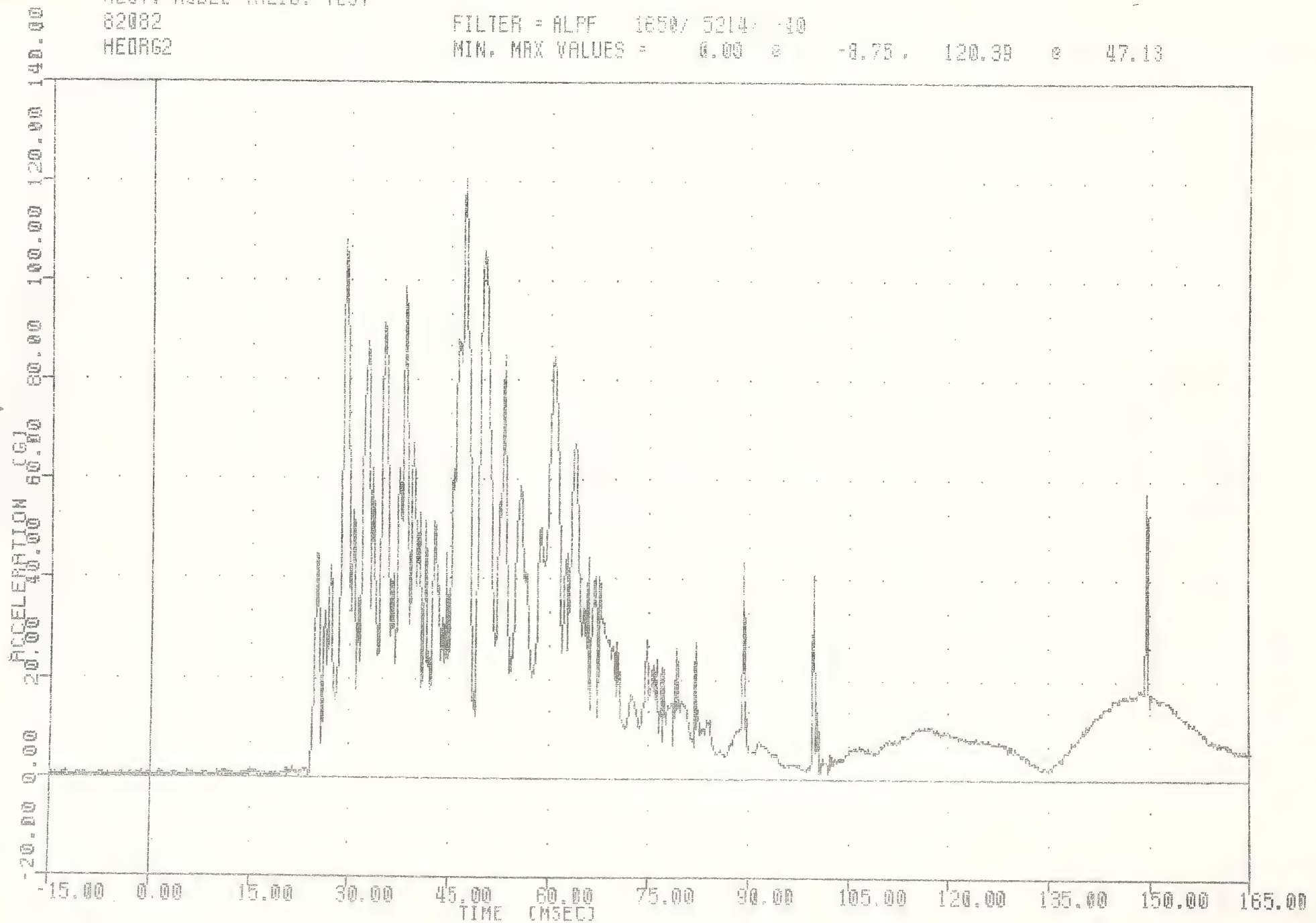
551120003 , TRC067 2-APR-82 11:27:24
REST. MODEL VALID. TEST
82082 FILTER = ALPF 1650/ 5214/ -40
HEDY62 MIN. MAX VALUES = -59.83 @ 37.25 , 52.49 @ 30.38



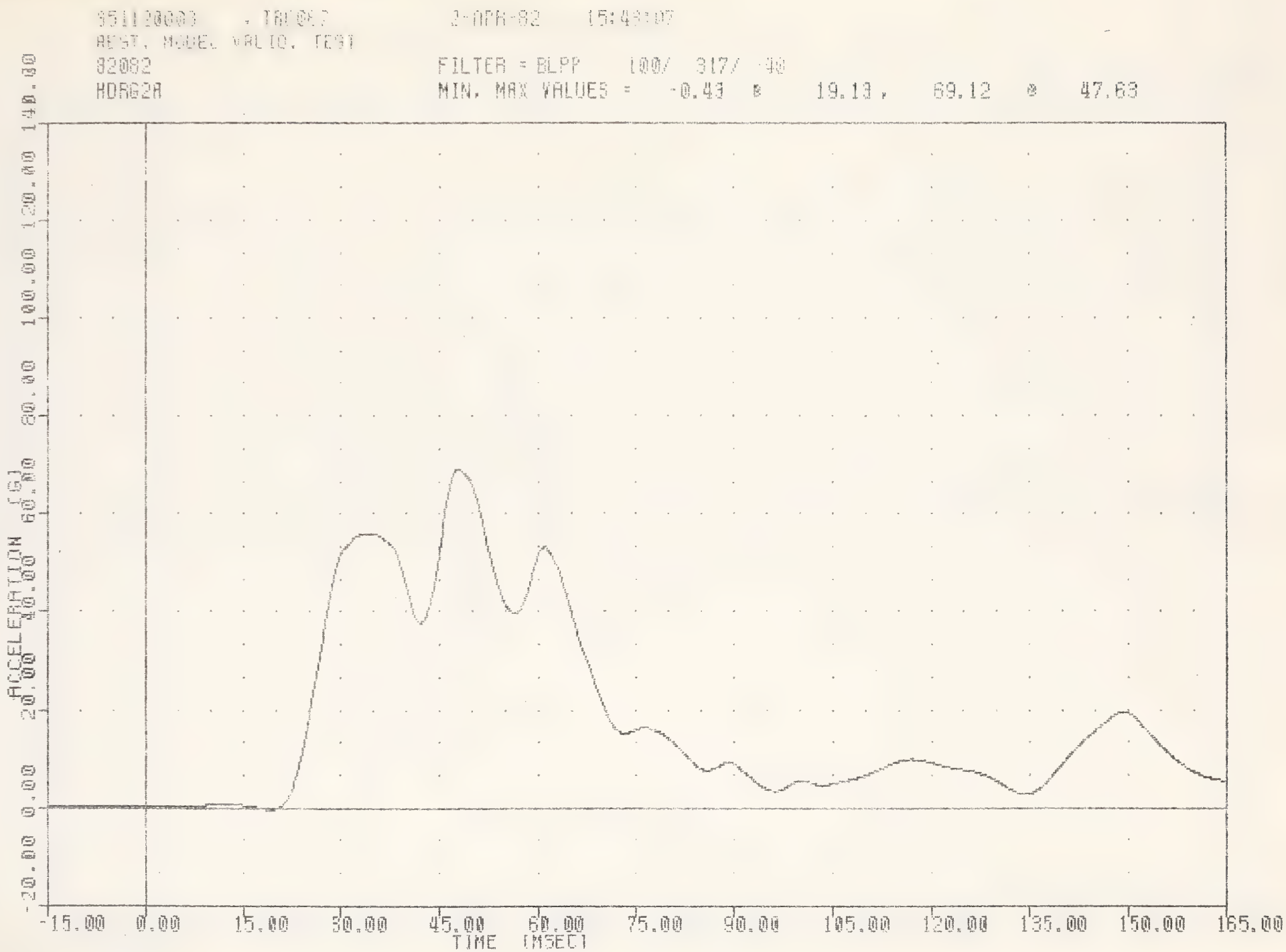
HEAD ACCELERATION Y AXIS PASSENGER



HEAD ACCELERATION Z AXIS PASSENGER

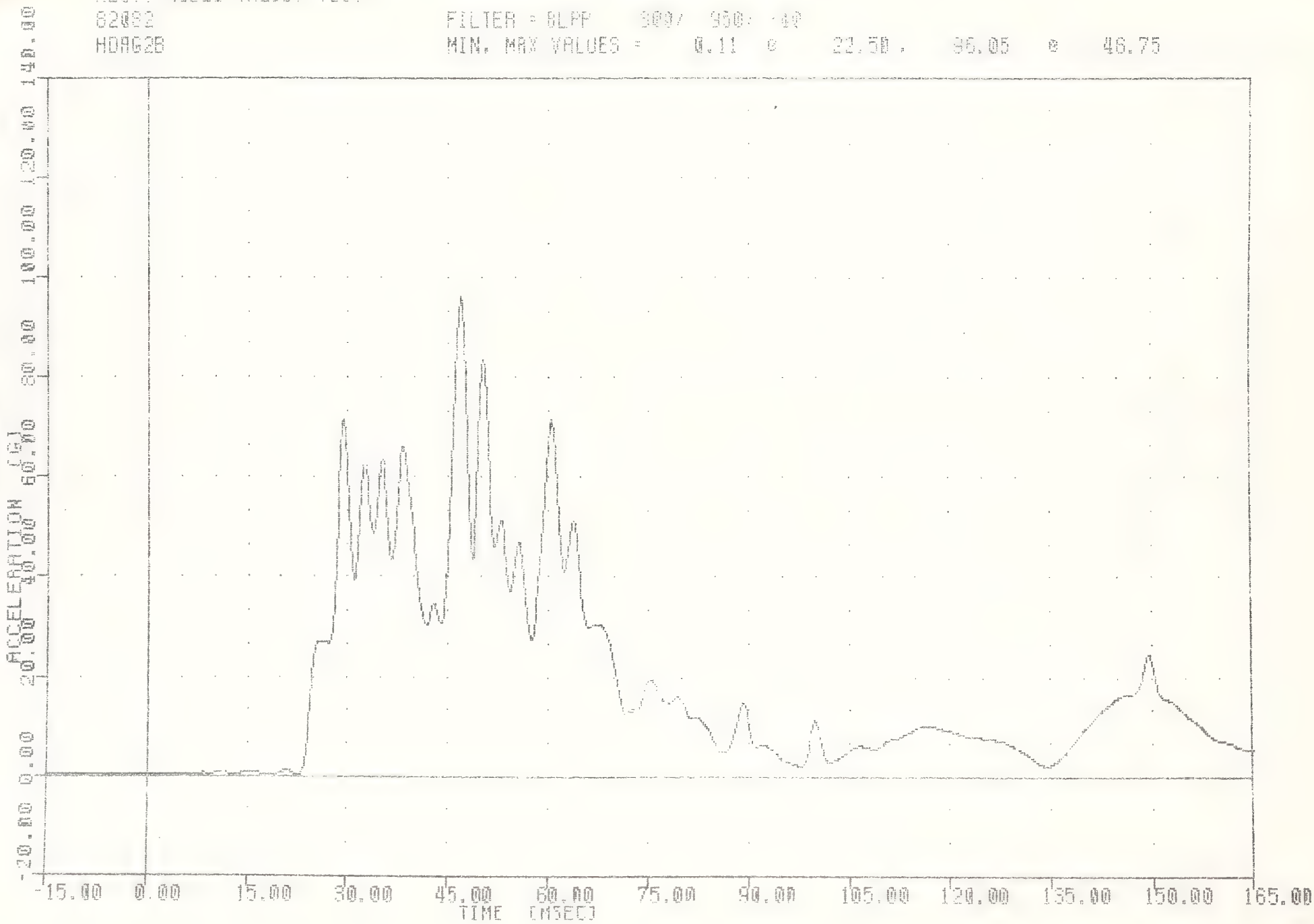


HEAD ACCELERATION RESULTANT PASSENGER

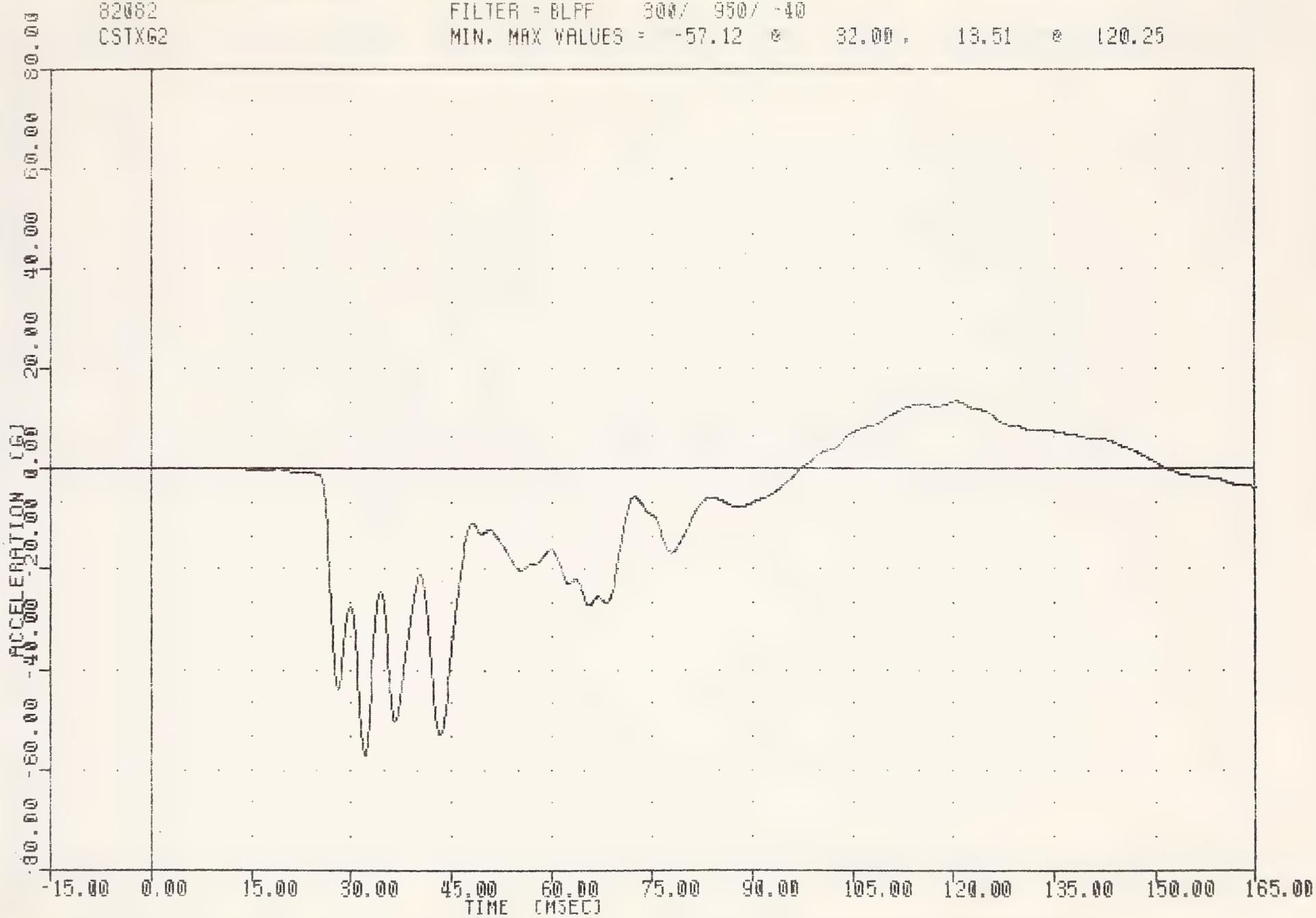


3 YR OLD HEAD RESULTANT (CLASS 100)

S511300G3 , TRC067 2-APR-82 15:43:07
REST. MODEL VALID. TEST
82092 FILTER = BLPP 300/ 900: 40
HDAG2B MIN. MAX VALUES = 0.11 @ 22.50 , 96.05 @ 46.75

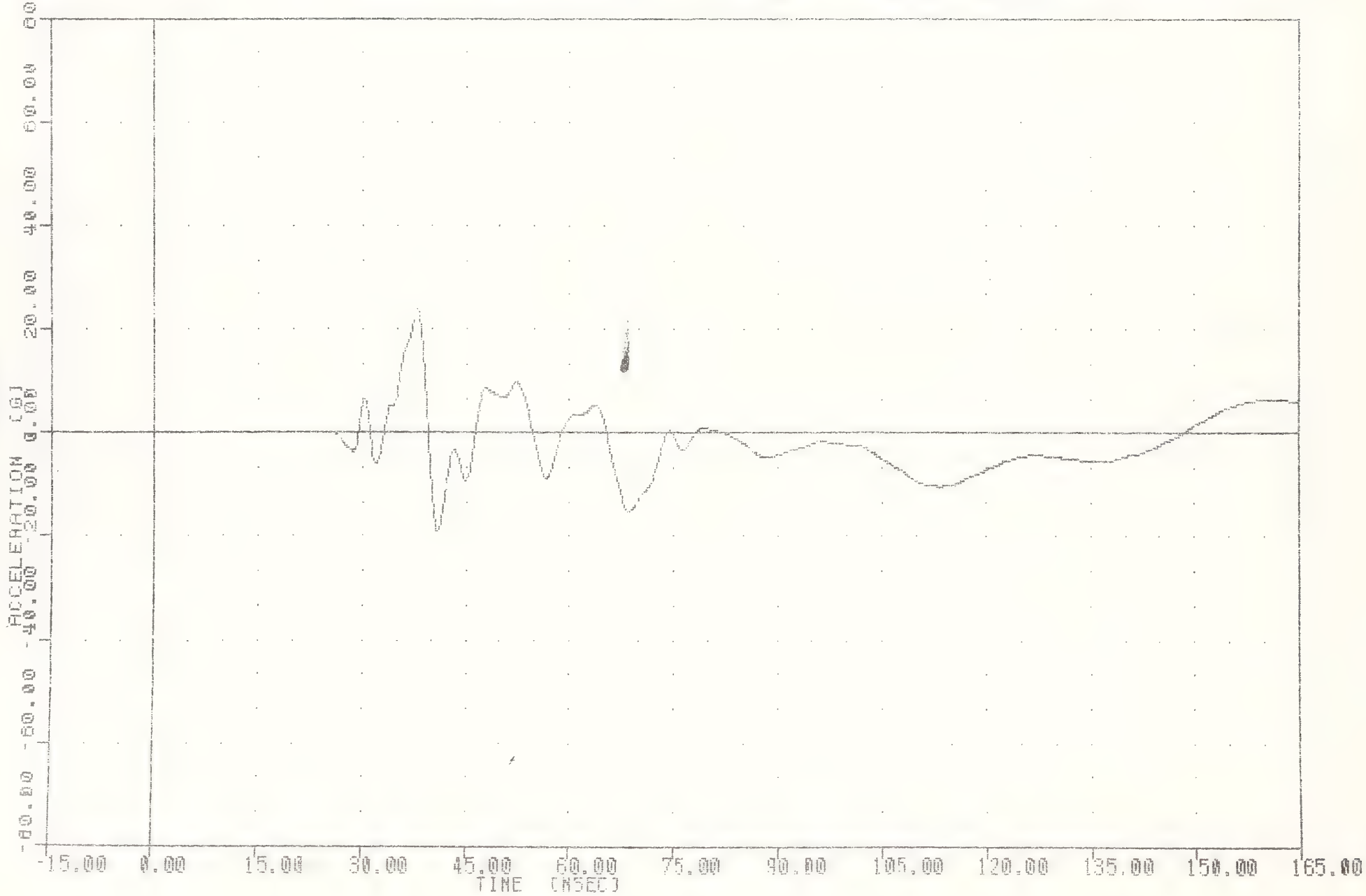


3 YR OLD HEAD RESULTANT (CLASS 180)

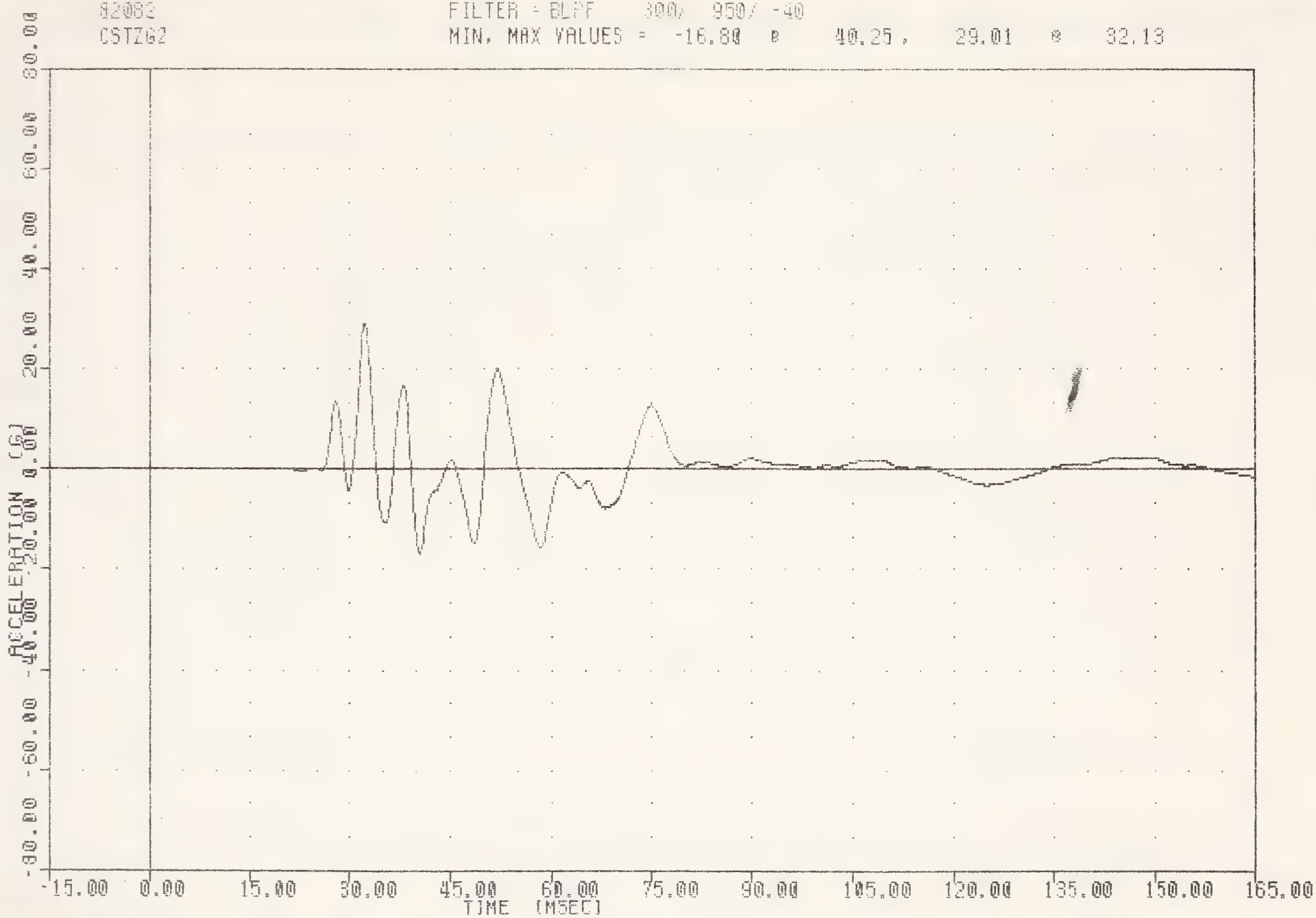


CHEST ACCELERATION X AXIS PASSENGER

S91120003 , TRC067 2-APR-82 11:27:24
REST. MODEL VALID. TEST
82082 FILTER = BLFF 300/ 950/ -40
CSTY62 MIN. MAX VALUES = -19.08 @ 10.75 , 23.92 @ 37.75

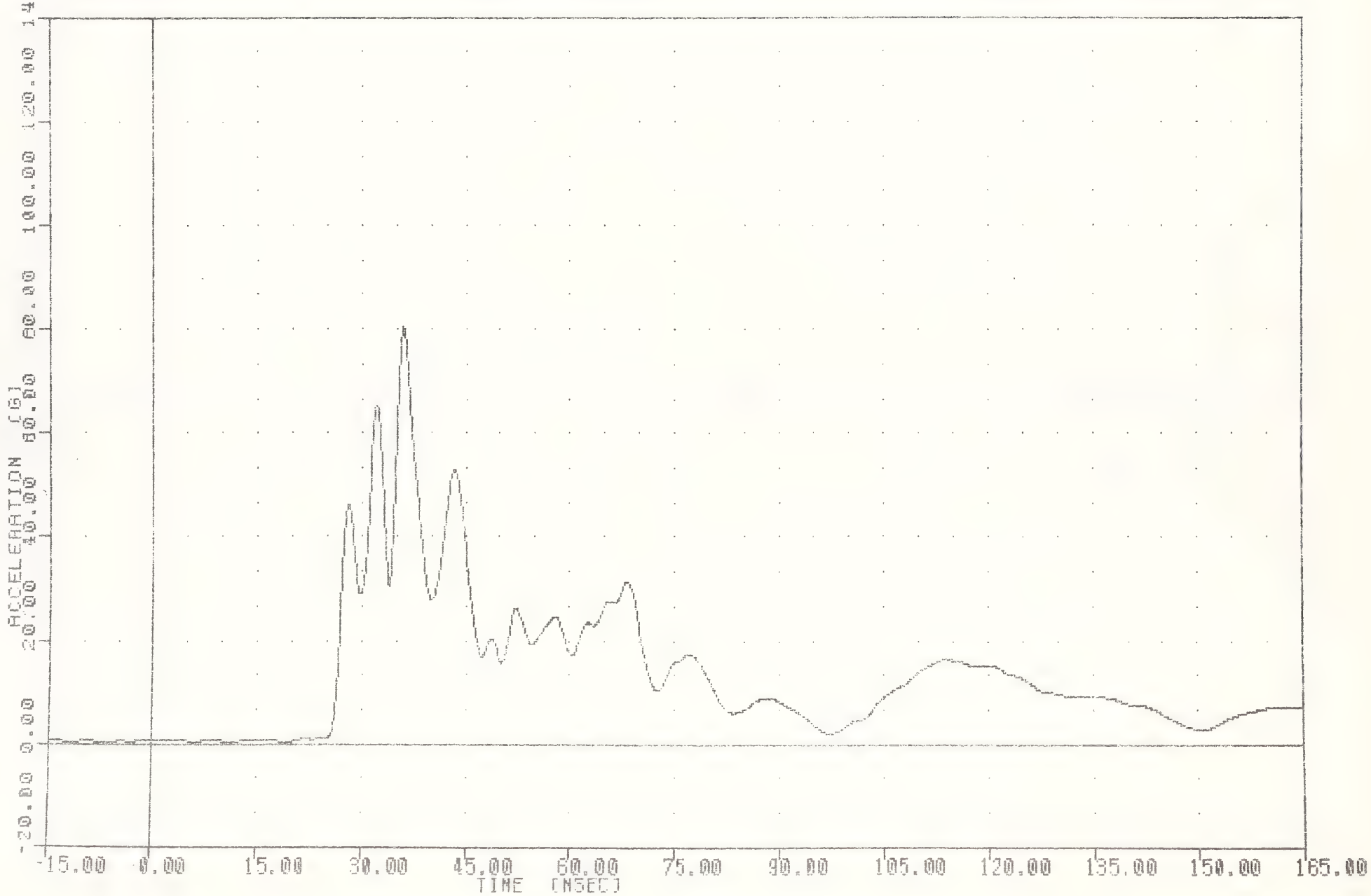


CHEST ACCELERATION Y AXIS PASSENGER



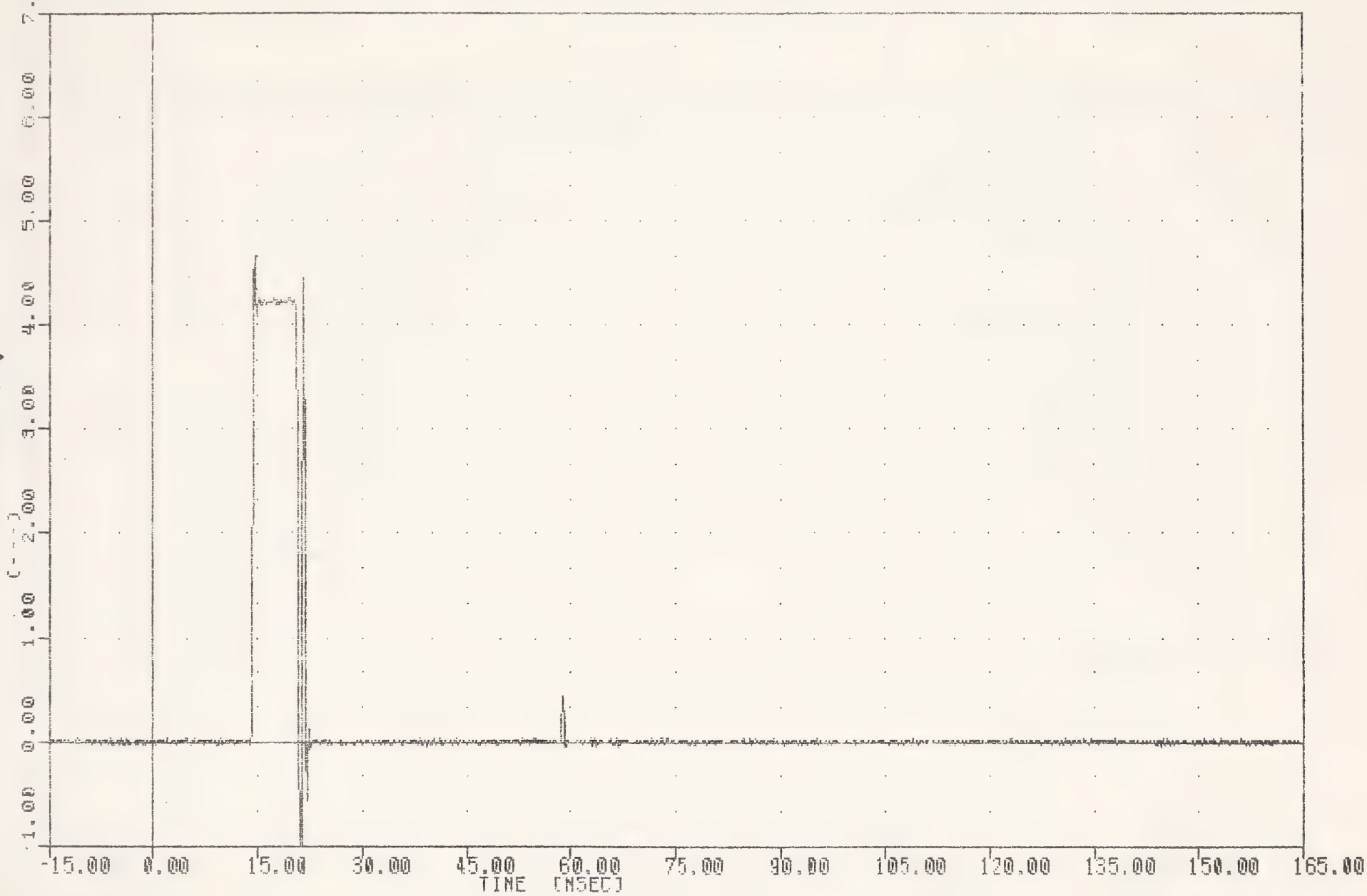
CHEST ACCELERATION Z AXIS PASSENGER

S51120003 , TRC067 2-APR-82 11:27:24
AEST. MODEL VALID. TEST
82082 FILTER = BLPF 300/ 950/ -40
CSTR62 MIN. MAX VALUES = 0.34 @ 11.00 , 80.53 @ 35.88



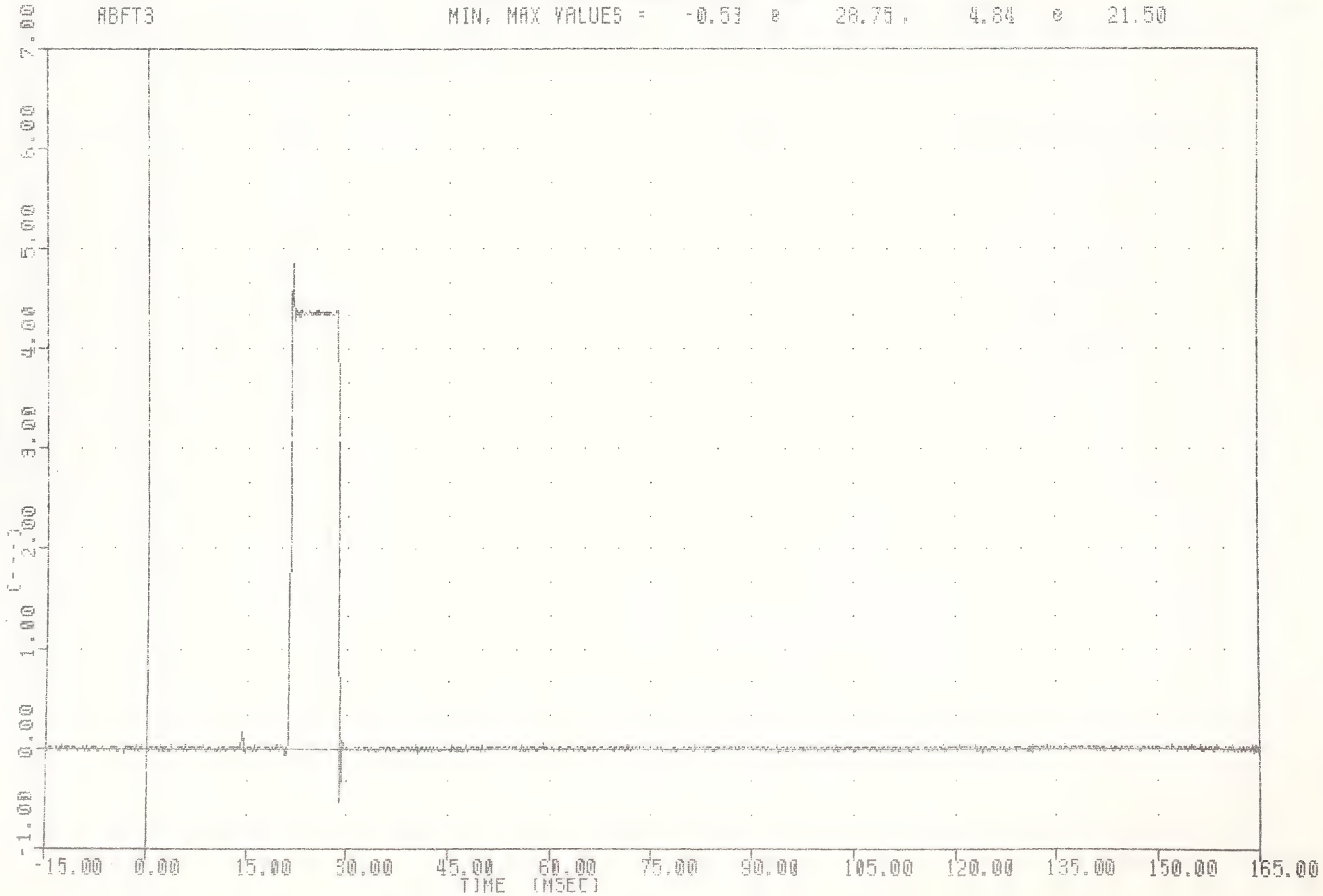
CHEST ACCELERATION RESULTANT PASSENGER

S51120003 , TRC067 2-APR-82 11:27:24
BEST. MODEL VALID. TEST
82082 FILTER = ALPF 1650/ 5214/ -40
ABFT2 MIN. MAX VALUES = -4.69 @ 21.00 , 4.67 @ 14.50

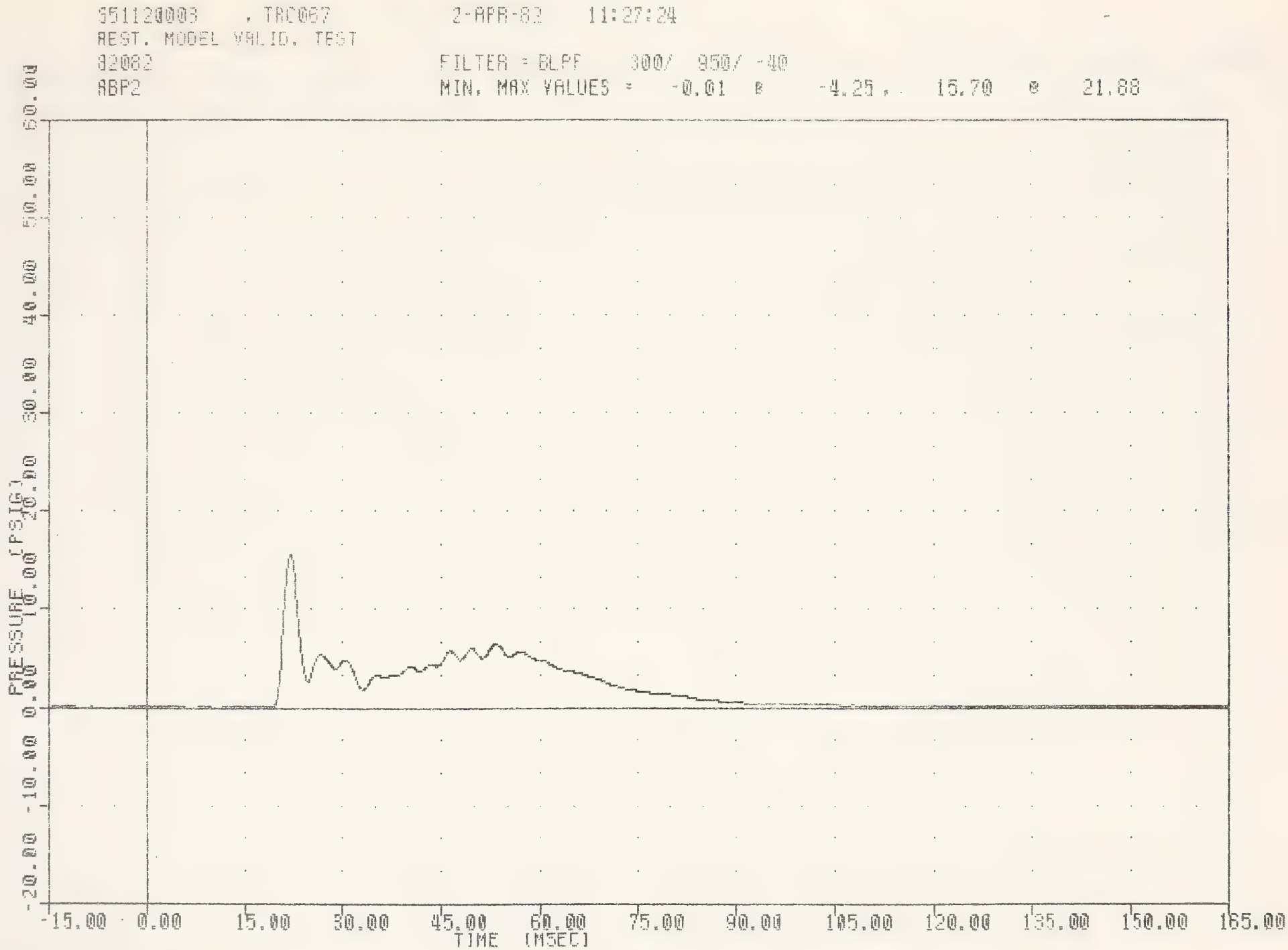


AIR BAG FIRING EVENT PASSENGER

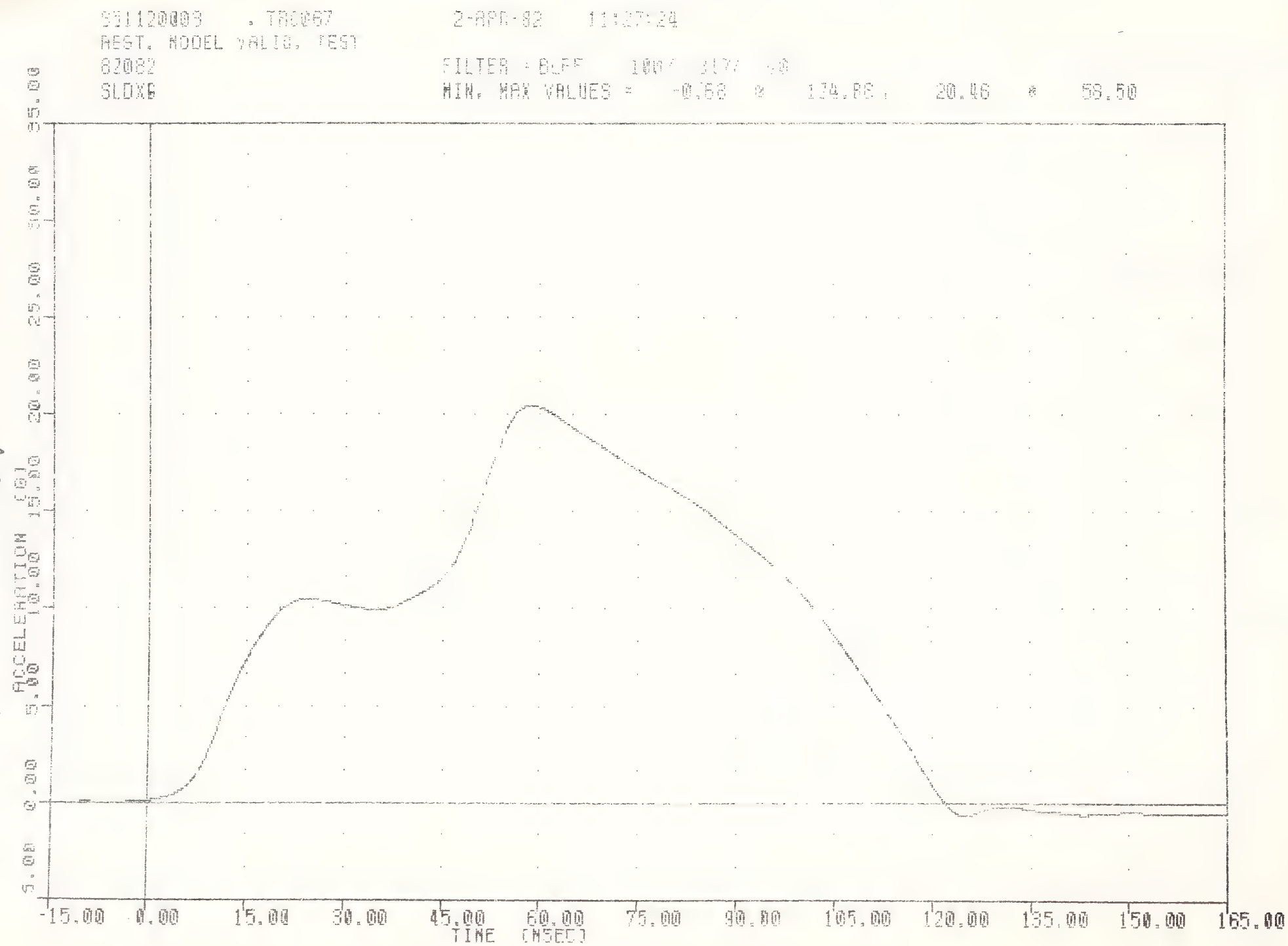
S511200003 , TRC067 2-APR-82 11:27:24
REST. MODEL VALID. TEST
82082 FILTER = ALPF 1650/ 5214/ -40
ABFT3 MIN, MAX VALUES = -0.53 @ 28.75 , 4.84 @ 21.50



AIR BAG FIRING EVENT 3

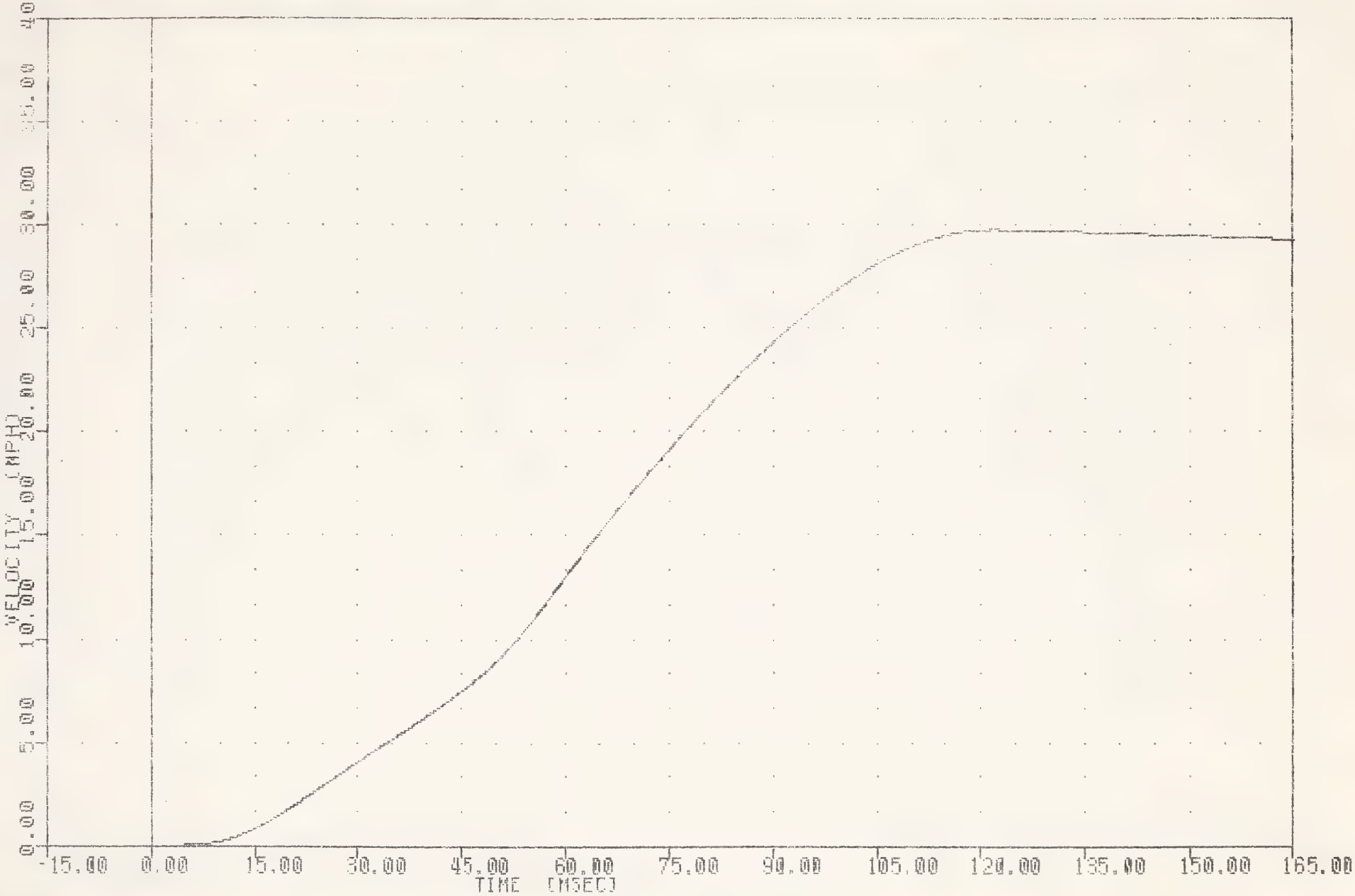


AIR BAG PRESSURE PASSENGER

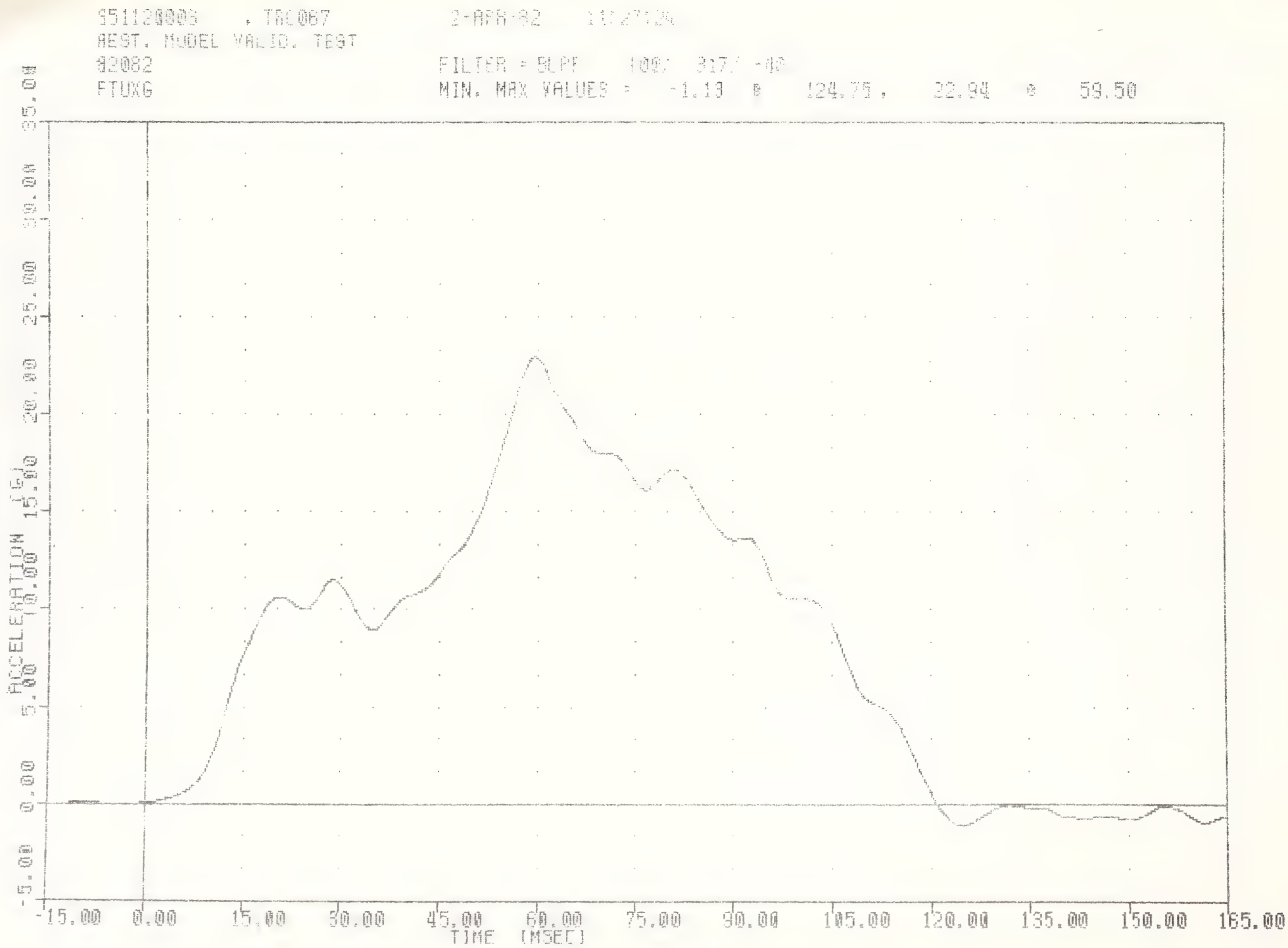


SLED ACCELERATION

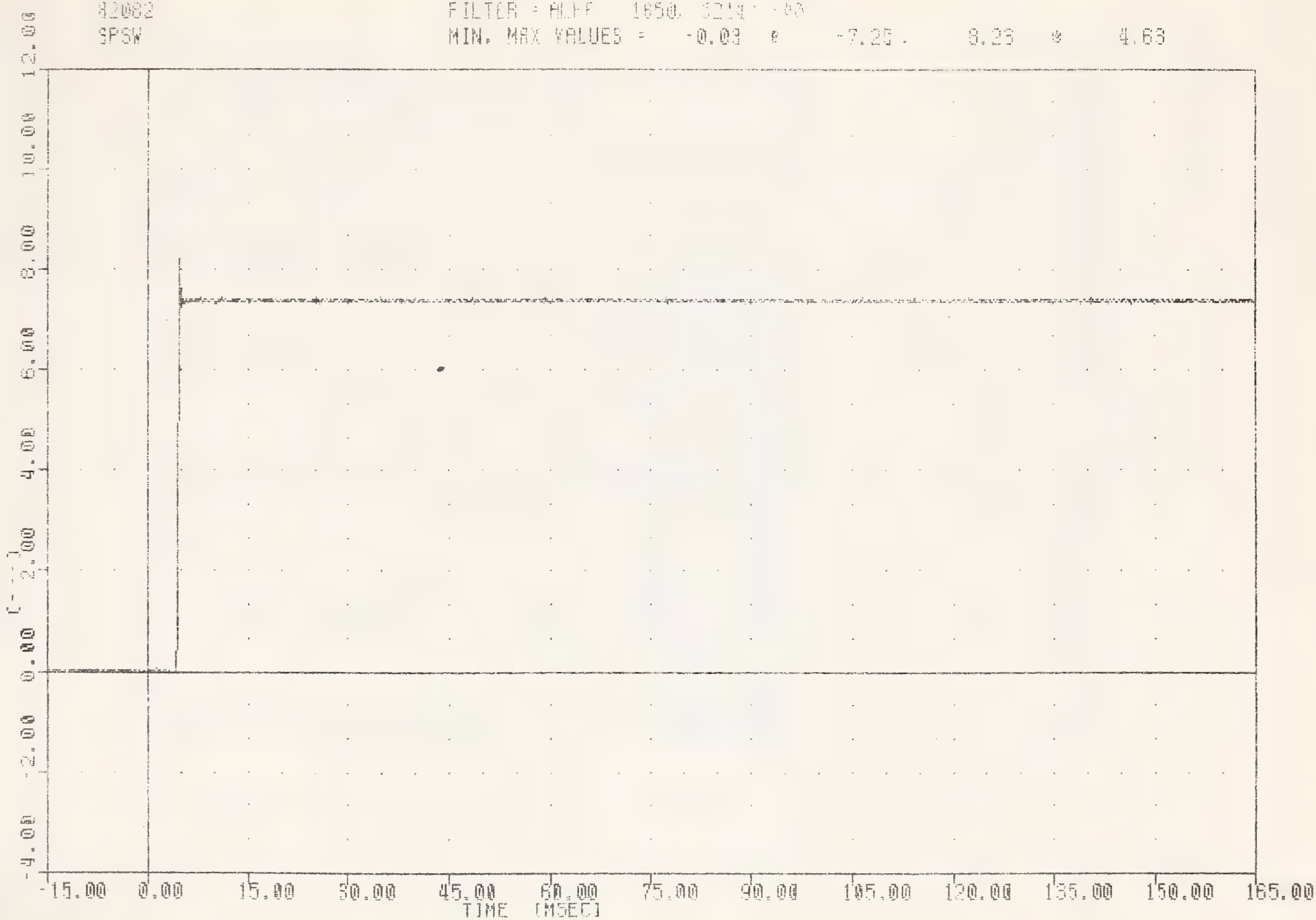
S51120003 , TRCWBT 2-APR-6[illegible]
BEST. MODEL VALID. TEST
82092 FILTER = 6LPF [illegible]
SLOXV MIN, MAX VALUES = -16.50 @ 40.25 , 29.73 @ 121.75



SLED VELOCITY IN MPH



FLOOR PAN TUNNEL ACCELERATION



SLED POSITION SWITCH

DUMMY HEAD RESPONSE TO MALLET BLOW

APPENDIX B

The traces included in this Appendix show the acceleration-time history of the response of various dummy heads to a mallet blow. The mallet blow was the same for each dummy head insofar as the technician was able to approximate the intensity and relative positioning of each blow to be the same. Please note the qualitative difference between the 3 yr old dummy head response and the other dummy sizes for the same mallet blow. We believe this supports the statements made regarding the 3 yr old ATD head response made on pages 4-19 and 4-21.

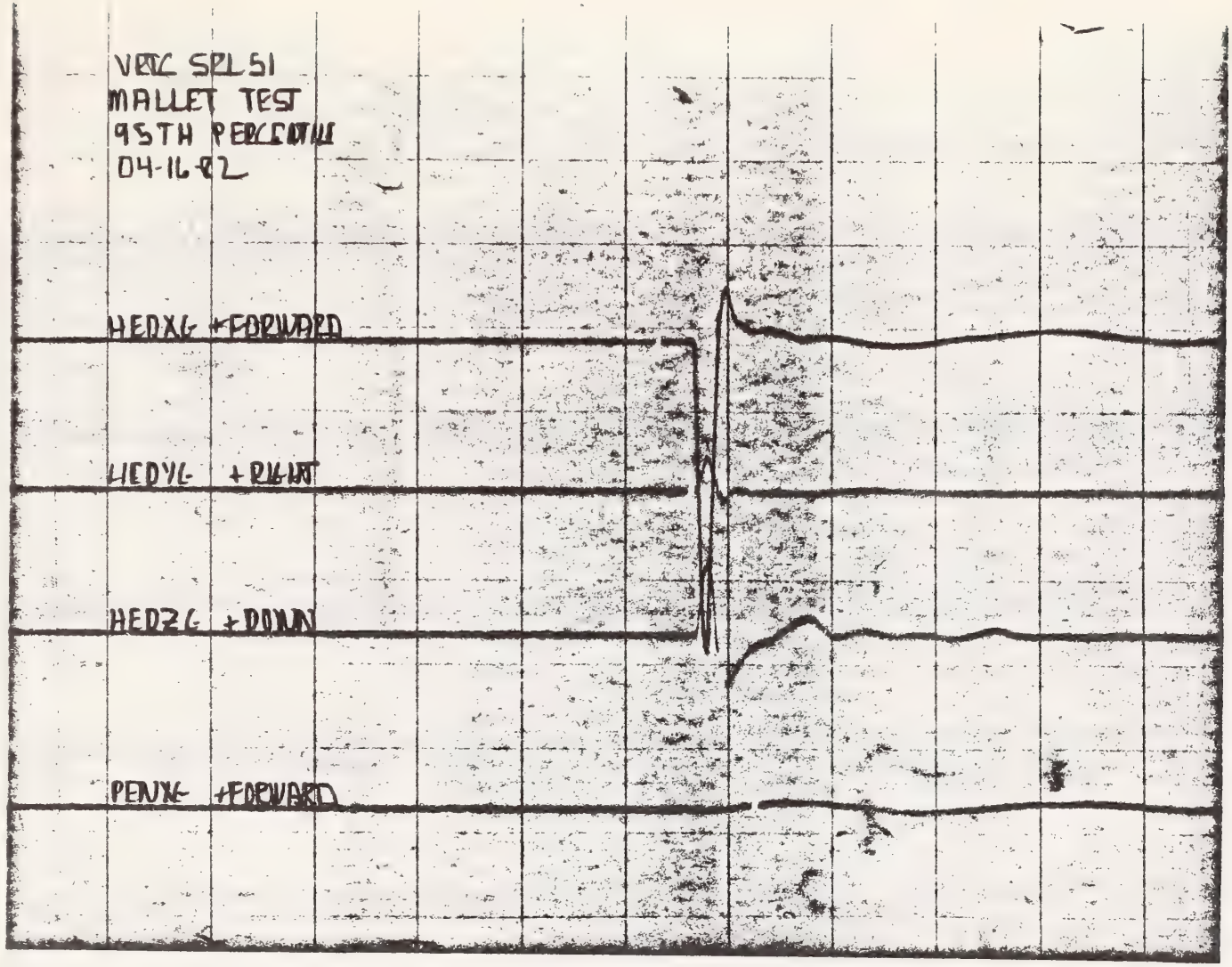


Figure B-1. 95th Percentile Male ATD Head Response to Mallet Blow.

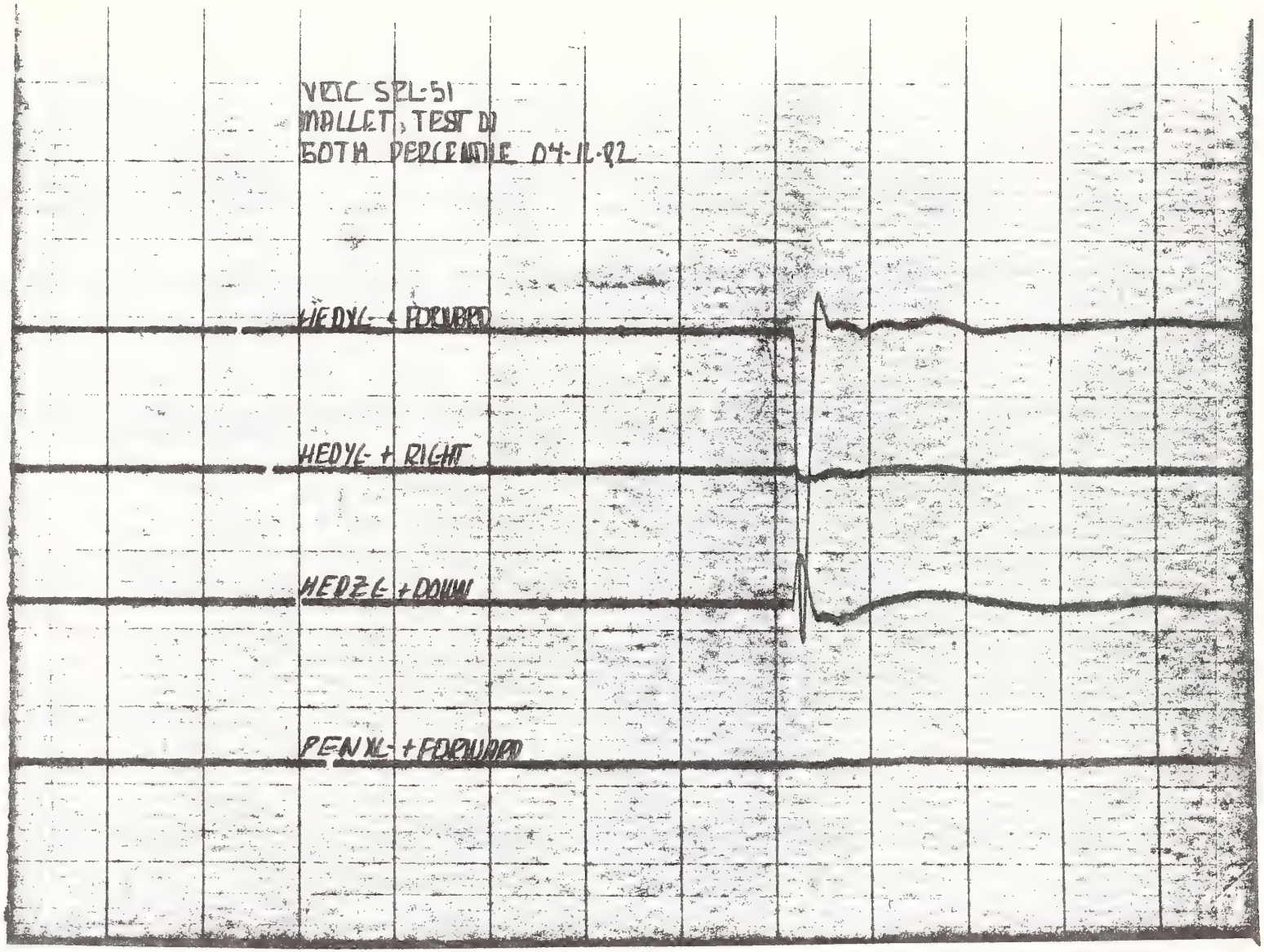


Figure B-2. 50th Percentile Male ATD Head Response to Mallet Blow

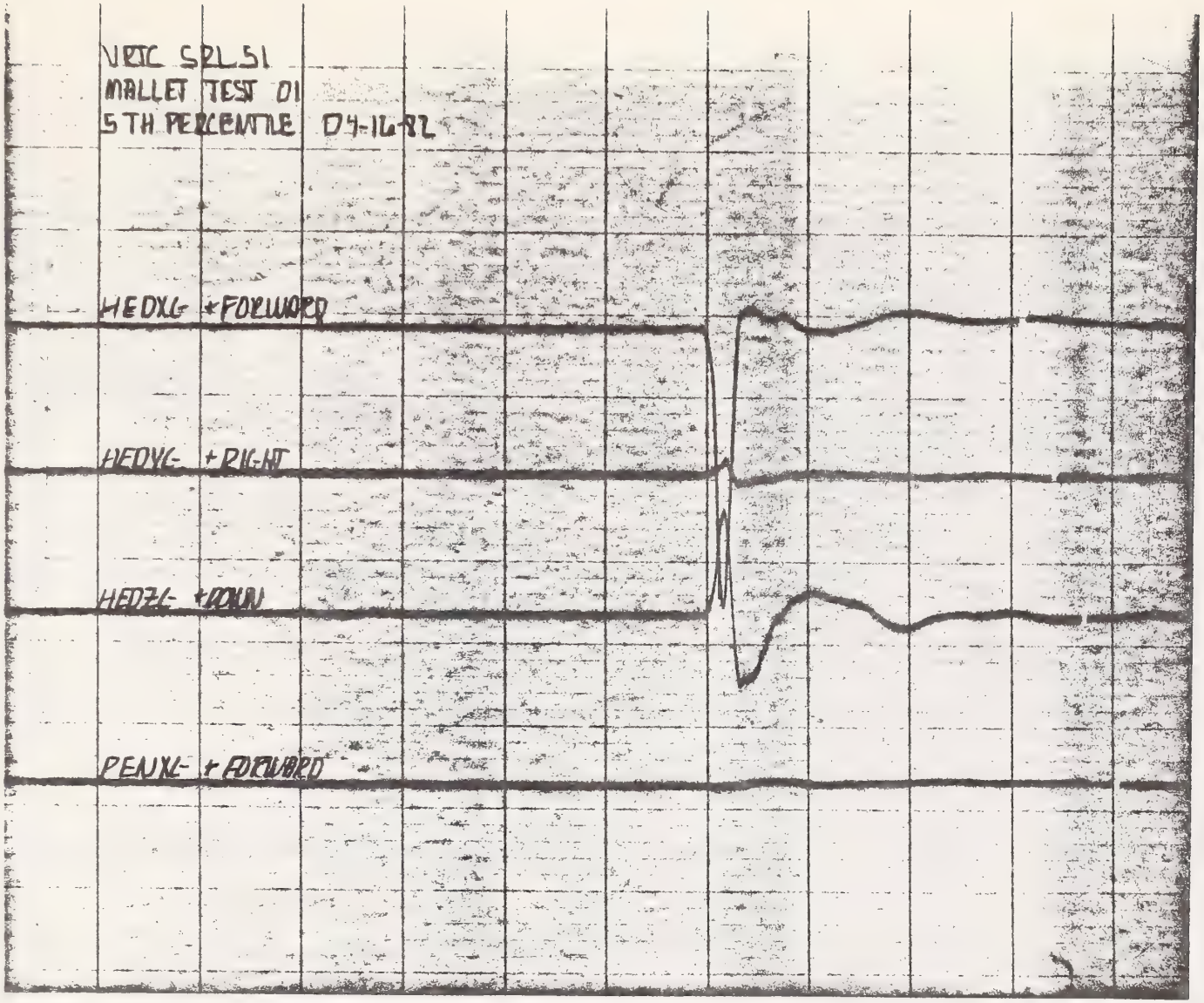


Figure B-3. 5th Percentile Female ATD Head Response to Mallet Blow

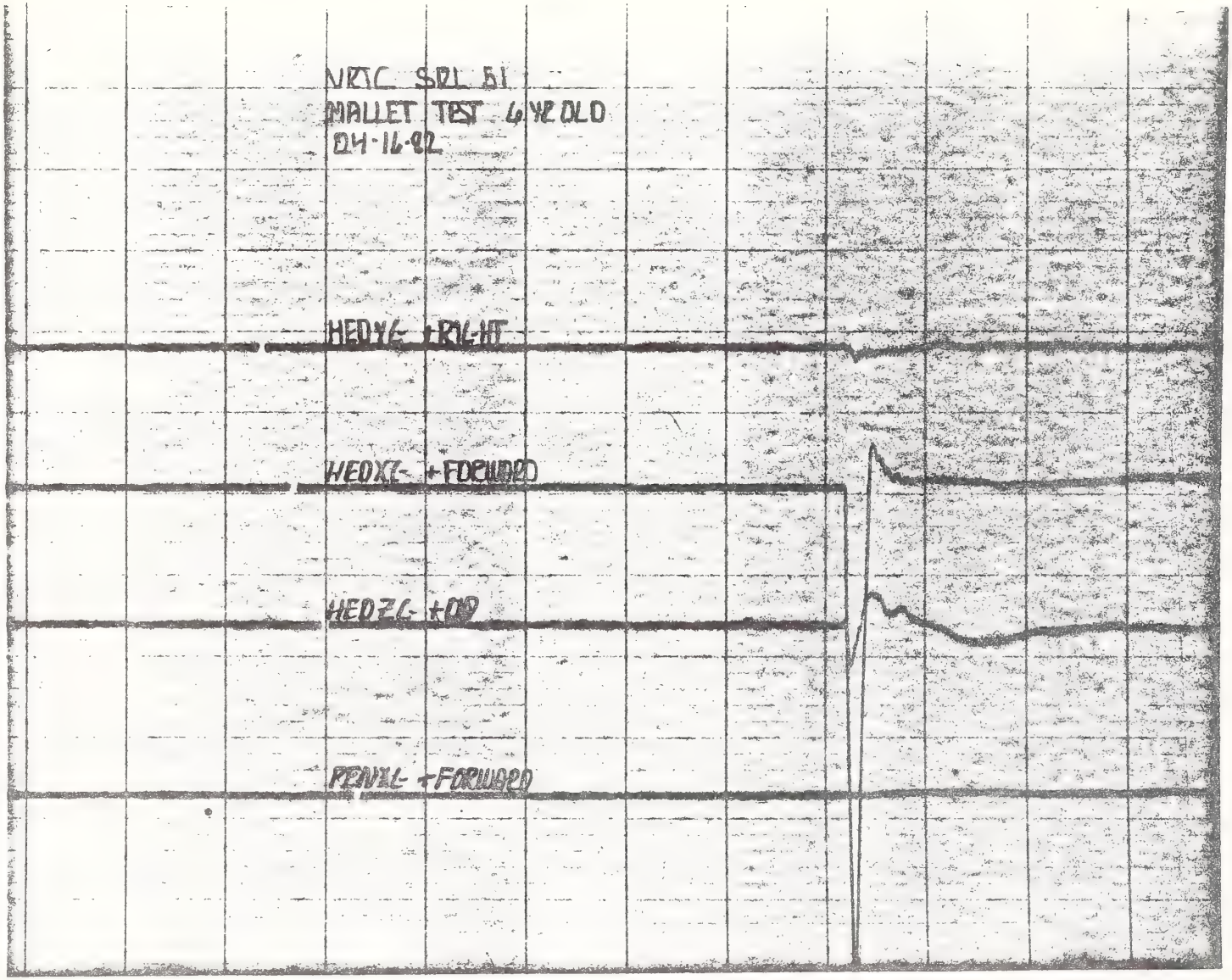


Figure B-4. Six Year Old Child ATD Head Response to Mallet Blow

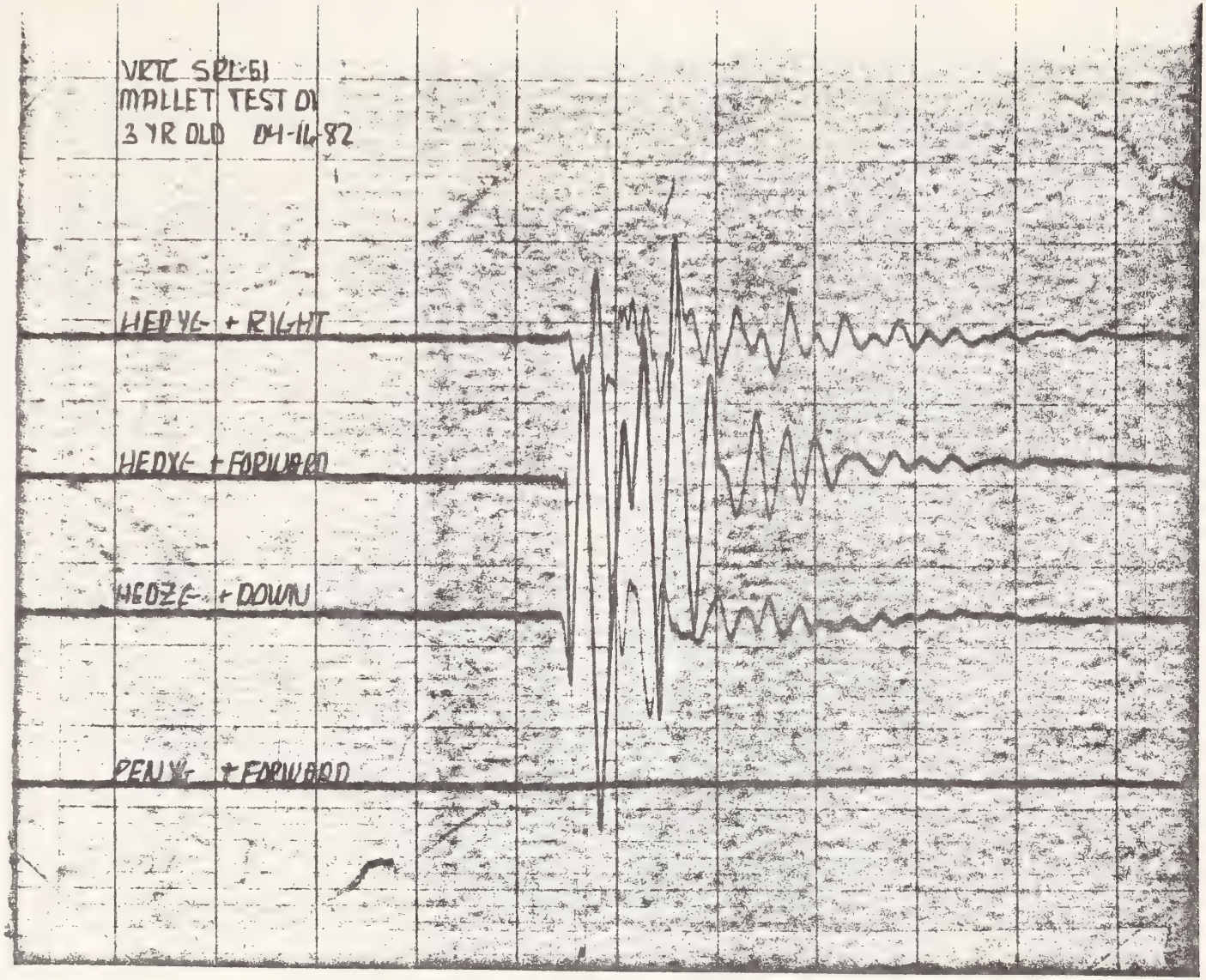


Figure B-5. Three Year Old Child Head Response to Mallet Blow

"PAC" VALIDATION COMPUTER RUN

APPENDIX C

```
LSPAC        14:27EDT     05/27/82

INPUT FILE NAME?TRCST7

ENTER 1 IF YOU WANT FULL LIST OF OUTPUT; ENTER 2 IF YOU WANT ABBREVIATED LIST.?2

ENTER 1 IF 2 IDENTICAL GAS GENERATORS ARE BEING USED TOGETHER.?1

ENTER STAGING TIME IN SECONDS.?.007



INPUT VALUES -- INPUT UNITS( MSEC, MPH, DEGREES, INCHES, LBS, FT-LBS, G'S)
INITIAL VELOCITY:          34.0
INITIAL HEAD ANGLE:         -9.50
INITIAL TORSO ANGLE:         -27.5
      MLEG      MTORSO     MSTERN      MHEAD       RT        RN        RH       RTOPH
      71.0       58.4       2.50       11.4       14.0      20.5      4.75       28.7
     NPTS NECK  NPTS KR  NPTS VEH  NPTS SEAT NPTS GAS SL.ST     SL.KR
         3          8        18          6         12 0.500E+04 0.240E+04
     NPTS STER NPTS CHST
         5          5
GAS FLOW TIME
        0.        15.0       18.0       23.5       28.5      33.5      38.5       43.5
      48.5        53.5
GAS FLOW TIME
      68.5        100.
GAS FLOW - LB/SEC
        0.          0.       3.40       4.09       4.26      3.60      2.45       1.63
     0.980       0.490
GAS FLOW - LB/SEC
        0.          0.
SEAT FRICTION DISPLACEMENT
     -50.0          0.       1.00       14.0       15.0      50.0
SEAT FRICTION FORCE - LBS
        0.          0.       350.       350.         0.        0.
NECK ANGLE
     -81.0        18.0       90.0
NECK TORQUE - FT-LBS
      117.          0.      -87.0
VEH. PULSE - TIME
        0.        7.00       17.0       21.0       26.0      33.0      45.0       52.0
      54.0        58.0
VEH. PULSE - TIME
      65.0        70.0       76.0       80.0       90.0      93.0      107.       150.
VEH. PULSE - DECELERATION
        0.          0.       13.3       12.7       15.6      10.7      18.3       29.8
      30.7        29.8
VEH. PULSE - DECELERATION
      21.3        23.2       17.8       19.5       11.7      12.6        0.         0.
KNEE DISPLACEMENT
        0.        2.00       2.50       2.75       3.00      3.50      4.50       15.0
```

KNEE FORCE - LBS

0.	0.	200.	700.	0.180E+04	0.230E+04	0.250E+04	0.270E+04

STERNUM DISPLACEMENT

-50.0	0.	0.250	1.00	10.0

STERNUM FORCE - LBS

0.	0.	400.	0.160E+04	0.250E+05

CHEST DISPLACEMENT

-11.2	-1.25	0.	1.25	11.2

CHEST FORCE - LBS

-0.465E+04	-150.	0.	150.	0.465E+04

ATMOP	PGZ	GTZ	U	PN1	PN2	PN3	
14.7	0.	0.166E+04	662.	1.40	1.40	1.40	
VC1	VC2	AV	FSA	FSB	FSC	X1	Y1
0.700	0.700	4.00	13.0	2.00	11.0	13.4	24.5
A0	THETAD	FABWGT	STDAMP	CDAMP	DMS	DINF	WSDCK
9.50	0.	8.40	0.	3.00	6.00	4.00	13.0
WH	DROLLZ	X2Z	Y2Z	WB	LF	DCN	
6.10	5.00	31.7	8.38	18.4	16.7	0.	
THFO	THLO						
19.0	44.0						

TIME (MS)	CST R GS (G'S)	HD R GS (G'S)	STN ACC (G'S)	FEM FORCE (LBS)	GEN FLO (LB/S)	BAG PRESS (PSIG)
0.	0.00	0.00	0.00	0.	0.	0.
5.00	0.24	0.42	-5.90	0.	0.	0.
10.00	0.32	0.38	-7.51	0.	0.	0.
15.00	0.31	0.41	-7.60	0.	0.00	-0.03
20.00	0.37	0.62	-7.66	0.	3.65	15.07
25.00	0.75	1.09	-7.28	0.	7.54	2.33
30.00	1.42	1.84	-6.52	0.	8.09	1.68
35.00	1.74	2.19	-6.77	0.	7.50	1.06
40.00	1.69	2.12	-6.59	0.	5.87	-0.03
45.00	4.01	1.15	-213.88	52.67	4.00	0.25
50.00	17.04	8.27	-83.89	1089.01	21.49	0.09
60.00	22.36	11.23	-12.32	1078.70	0.82	3.12
65.00	28.08	18.24	-21.03	1096.82	0.46	4.35
70.00	33.74	32.48	-29.19	1088.07	0.18	5.51
75.00	39.86	44.46	-37.28	1082.22	0.02	6.54
80.00	45.21	53.63	-44.09	1079.97	0.	7.29
85.00	48.12	60.69	-48.84	997.89	0.	7.66
90.00	47.91	61.68	-50.22	731.95	0.	7.50
95.00	43.44	56.88	-47.38	323.40	0.	6.76
100.00	38.15	40.23	-43.20	0.	0.	5.60
105.00	26.51	33.33	-30.79	0.	0.	4.20
110.00	16.53	20.98	-19.28	0.	0.	2.72
115.00	9.85	4.50	-11.70	0.	0.	1.32
120.00	2.69	4.95	-2.75	0.	0.	0.14
125.00	1.80	4.45	-0.54	0.	0.	0.
130.00	1.70	3.84	0.15	0.	0.	0.
135.00	1.70	3.23	0.76	0.	0.	0.
140.00	1.74	3.03	1.22	0.	0.	0.
145.00	1.77	3.42	1.53	0.	0.	0.
150.00	1.77	4.11	0.	0.	0.	0.

TIME (MS)	TORSO ANG (DEG)	HEAD ANG (DEG)	FEMUR ANG (DEG)	STV WR CST (FPS)	H-P R.D. (INCHES)	CHEST DEFL (INCHES)
0.	-27.50	-9.50	19.00	0.	0.	0.
5.00	-27.50	-9.49	19.00	0.38	0.00	0.
10.00	-27.51	-9.47	19.00	0.42	0.00	0.
15.00	-27.51	-9.45	19.00	0.36	0.05	0.
20.00	-27.50	-9.44	19.00	0.31	0.19	0.
25.00	-27.46	-9.43	19.00	0.24	0.45	0.
30.00	-27.37	-9.44	19.00	0.18	0.83	0.
35.00	-27.17	-9.49	19.00	0.18	1.31	0.
40.00	-26.84	-9.62	19.72	0.15	1.87	0.
45.00	-26.38	-9.81	21.46	-3.33	2.53	-0.45
50.00	-25.90	-9.47	23.40	0.	3.33	0.
55.00	-25.07	-8.42	25.42	0.	4.21	0.
60.00	-23.48	-7.01	27.27	0.	5.08	0.
65.00	-21.26	-4.94	28.82	0.	5.86	0.
70.00	-18.54	-2.43	29.98	0.	6.47	0.
75.00	-15.48	-0.22	30.73	0.	6.88	0.
80.00	-12.22	1.17	31.01	0.	7.03	0.
85.00	-8.93	1.49	30.81	0.	6.92	0.
90.00	-5.91	0.72	30.15	0.	6.56	0.
95.00	-3.53	-0.80	29.13	0.	6.02	0.
100.00	-2.15	-2.53	27.92	0.	5.40	0.
105.00	-2.01	-3.20	26.67	0.	4.79	0.
110.00	-2.84	-3.05	25.33	0.	4.17	0.
115.00	-4.29	-2.16	23.90	0.	3.54	0.
120.00	-6.15	-0.04	22.38	0.	2.90	0.
125.00	-8.13	2.81	20.79	0.	2.27	0.
130.00	-10.12	5.91	19.11	0.	1.64	0.
135.00	-12.10	8.98	19.00	0.	1.01	0.
140.00	-14.04	11.74	19.00	0.	0.37	0.
145.00	-15.92	13.98	19.00	0.	-0.28	0.
150.00	-17.73	15.53	19.00	0.	-0.93	0.

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ENTER 1 TO CALCULATE HIC?1

THE HIC IS    6.3593674E+02
T1=    7.0000000E-02
T2=    1.1000000E-01

PROGRAM STOP AT 1950

USED     61.28 UNITS
BYE
00061.95  CRU     0000.11  TCH     0009.08  KC

OFF AT 14:33EDT 05/27/82
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TL 242 .F5854

Fitzpatrick,

Systems anal
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